

WPS-2221

## POLICY RESEARCH WORKING PAPER

2221

# The Dynamics of Poverty and the Effectiveness of Poland's Safety Net (1993–96)

*Włodzimierz Okrasa*

Changes in Poland's family allowances and unemployment benefits have significant but different effects on different groups of households. In deciding on strategies to address long-term poverty, policymakers must take such differences into account.



## Summary findings

Okrasa analyzes how the incidence of household endowments and the allocation of social benefits affect families' transitions into and out of poverty.

Using panel data for 1993–96 from Poland's Household Budget Survey, and a framework based on sample survival analysis techniques, Okrasa evaluates how various policies will affect households with specific characteristics that make them likely to become poor or to move out of poverty under different scenarios (including whether or not they receive a given amount of a particular type of social transfer).

He also discusses how nonincome sources of welfare, such as savings, credits, and loans, affect the likelihood that families will become or stop being poor.

He concludes that family allowances and unemployment benefits, the two major social programs analyzed, have significant but different effects on different groups of households (characterized in terms of the age, gender, marital status, and educational attainment of the head of household; the size, type, location, and sector of employment of the family or household; and the year in which the household fell into poverty).

If the share of family allowances in total household income were reduced by 1 percent, for example, the average length of poverty would be increased by roughly 2 percent. But a 1 percent change in unemployment benefits would yield a 3 percent change in the average duration of poverty. Differences in hazard rates for various subgroups would be even greater.

Households in villages were much more likely to fall into poverty than households in cities and large towns, but the poor in towns and cities had more difficulty exiting poverty.

There was generally less poverty mobility among households headed by public sector employees than among those headed by employees in the private sector.

Families with three or more children and one-parent families (and grandparents with children) faced the greatest risk of being poor; single-person households and childless married couples were the least endangered. Small nuclear families with one or two children and families without children fell between these two extremes.

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This paper — a product of Poverty and Human Resources, Development Research Group — is part of a larger effort in the group to analyze the dynamics of poverty and the effectiveness of the safety net. The study was funded by the Bank's Research Support Budget under the research project "Household Welfare Change during the Transition" (RPO 681-21). Copies of this paper are available free from the World Bank, 1818 H Street, NW, Washington, DC 20433. Please contact Sheila Fallon, room MC3-558, telephone 202-473-8009, fax 202-522-1153, email address [sfallon@worldbank.org](mailto:sfallon@worldbank.org). Policy Research Working Papers are also posted on the Web at <http://www.worldbank.org/research/workingpapers>. The author may be contacted at [wokrasa@worldbank.org](mailto:wokrasa@worldbank.org). November 1999. (67 pages)

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# **THE DYNAMICS OF POVERTY AND THE EFFECTIVENESS OF POLAND'S SAFETY NET (1993-96)**

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This paper is a product of the research project RPO 681-21 supported by the Research Committee of the World Bank. The author gratefully acknowledges this support as well as contributions from the Development Research Group (DECRG) and from the Social Protection Board of the Human Development Network (HDNSP). The data used in this study come from the Household Budget Survey, conducted by the Central Statistical Office of Poland (GUS). The Institute of Economic Science of the Polish Academy of Sciences (INE-PAN) was instrumental in organizing the data from GUS. Helpful comments were received from participants in several World Bank seminars, in particular Emmanuel Jimenez, Martin Ravallion, Michal Rutkowski, Branko Milanovic. Carlos Cavalcanti and Erzo Luttmer provided useful comments. In addition, Carlos Cavalcanti helped in preparation of the executive summary.



## **The Dynamics of Poverty and the Effectiveness of Poland's Safety Net (1993-96)**

### **Executive Summary\***

This executive summary presents the main findings of this paper, focusing on the results and on the country context. The estimates and the methodology are presented in the body of the paper. The analysis presented in the paper is based on the construction of a four-year panel data set (from 1993 to 1996) from the Polish Household Budget Survey conducted annually by Central Statistical Office. The data is used to examine the role of social policies in mitigating long-term poverty during the period of economic recovery and growth. Two interconnected key policy issues emerge from this analysis: how the incidence of household endowments and the allocation of social benefits affect families' transition in and out of poverty. Specifically, (i) what are the chances of escaping from poverty, and what is the risk of falling into poverty? (ii) how effective have social transfer been in preventing long-term poverty?

The Polish economy is its eighth year of economic expansion, combining strong economic growth (the fastest in central Europe) and significant declines in inflation. Real GDP growth has averaged 5% since 1992, and inflation has declined from 70% in end-91 to just under 10% by end-98. While this period of sustained economic expansion has allowed Poland to be the first country in Central and Eastern Europe to surpass pre-transition (1989) GDP levels, it has also been marked by high incidence of persistent poverty. Indeed, 42 percent of all poor experienced poverty for three or four years between 1993 and 1996. As many as two-thirds of all poor, and almost one-third of the population, were poor for more than one year during this period.<sup>1</sup>

Previous poverty studies for Poland made no distinction between those who are temporarily poor and those who constitute the chronically poor.<sup>2</sup> In making this distinction, the report allows the reader to understand trends in poverty dynamics and how households transition in and out of poverty in Poland. In addition, this provides the opportunity to assess the effectiveness of existing social policies in reducing long-term poverty.

### **Poverty Profile**

**What accounts for this pattern of long term poverty?** There are certain characteristics that are clearly associated to long term poverty. These include households headed by persons with low educational achievement, households with many (3+) children, and households headed by single parents. This poverty profile that emerges from the previous report (Okrasa, 1999) concords with expectations (suggested also by 'static' poverty-based analyses -- World Bank 1995, 1999) that long term poverty in Poland is predominately rural and more prevalent among children. Two factors did account for this profile: the low level of educational achievements of heads of households in rural areas and the large number of dependents (mostly children). [In general, since many of the characteristics of long term poor households are typical of households living in rural areas, it is not surprising that households in rural areas account for a disproportionately high share of the long term poor.] While the social safety net was increasingly

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\* In this section are also mentioned some of the results discussed in Okrasa (1999) as this report was envisioned as a complementary to the previous one.

<sup>1</sup> See Okrasa (1999) for details.

<sup>2</sup> The fact that the UNDP poverty index for industrial countries (HPI-2) uses long-term unemployment as the only indicator of "social exclusion" illustrates the difficulty of getting statistical measures of persistent poverty.

able to capture the long term poor during the four year period, 16 percent of poor households fell between the cracks (around 700,000 households).

**How important were household characteristics in determining the risk of falling in, or the chance of raising out of poverty?** The influence of household characteristics on the risk of falling into chronic poverty during this period were found to be the following<sup>3</sup>:

- The *age* of the head of household inversely affected the risk of falling into the poverty zone, declining with each additional year of the head's age. While in poverty, however, the families headed by persons aged 51-65 had the lowest chances of exiting poverty. This may reflect their inability to take advantage of retraining opportunities, get a new job, or relocate to find a new or better-paying job.
- *Educational achievement.* The level of *education* achieved by the household head strongly affected the household's poverty status over time. When compared to households headed by holders of a university diploma (a reference category), other households faced risk of falling into poverty that was above three times higher.<sup>4</sup> Among the poor, for every ten households headed by university diploma holders that left the poverty zone, there were only six households with heads with any other level of education who did the same.
- *Type of household (family).* A firm pattern emerged from the comparison of the risk (the hazard function) between the households of different compositions. Families with three or more children and one-parent families (and grandparents with children) faced the greatest risk of being poor while single-person households and childless married couples were the least endangered. Small nuclear families, with one or two children, and families without children fell in between of these two extremes. Among the poor, the same types of families faced the lowest chances of exiting poverty -- in exactly the same order. The *size of the household* was also found to increase the risk of falling into poverty, even after controlling for household composition and location.<sup>5</sup> However, poor single-person households were fairly diverse with this respect depending on the marital status of the householder.
- *Marital status and gender.* The *marital status* and *gender* of the head of the household had a relatively lower impact on households' poverty status over time, although households headed by females, divorcees and widowers faced a somewhat greater risk of falling into poverty. But this impact depended also on the household member composition. For instance, among householders of the poor single-person households, those who had never married had the highest chances of escaping from poverty, while those who were widowed had the lowest probability. At the same time, the households of

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<sup>3</sup> Details are in Okrasa (1999).

<sup>4</sup> Household heads with no diploma or only an elementary school diploma faced the highest risk of being permanently poor (rather than never being poor). The risk was 35 times higher when compared to the risk faced by university graduates.

<sup>5</sup> The odds of falling into poverty increased by 1.28 times for each additional person in the household. Two additional persons made the household 1.63 times more likely to be chronically poor. Also, when one accounts for location, rural households were more vulnerable than urban households of identical size. The only exception is for very large households (5.5 persons or more), where urban households were more vulnerable than rural households.

widowed people had the smallest risk of falling into poverty while the households of people who had never been married had the highest risk of being impoverished.

**What other factors were important in determining the risk of falling and remaining in poverty?** Other factors that were important in determining the risk of falling and remaining in poverty include the following:

- *Location of the household.* Although the chance of avoiding poverty did not vary significantly according to *the location of the household*, there was a significant difference in the probability of falling into chronic poverty and remaining in chronic poverty. Households in villages were much more likely to fall into poverty than households in cities and large towns. However, the poor in cities and large towns faced greater difficulties in exiting poverty, signaling the potential risk of creating an “urban underclass”.
- *Sector of employment of the household.* *The sector of employment* of the head of household was defined as either the public or the private sectors throughout the entire period under study. Poor households headed by private sector employees had a slightly higher chance of escaping poverty, although this advantage was statistically significant only after accounting for unemployment compensations. Also, their relative risk of falling into poverty was lower after accounting for unemployment compensation and family benefits. This discrepancy between the exit rates into and out of poverty among households headed by the public-sector employees indicates that there was generally less poverty mobility in this group.
- *The year in which the household fell into poverty.* The year in which a household fell into poverty yields two types of information. The overall health of the economy and the stage of development of the country’s social safety net. This in turn translates into the relative risk of either falling into or exiting poverty. For those in poverty, the later a household entered the poverty zone, the harder it was to leave poverty. For instance, households that began their poverty spell in 1995 found it twice as hard to move out of poverty as those impoverished in 1994 (a reference year), and it was three times harder to exit poverty for those who began poverty in 1996. Analogously, households that avoided poverty until 1995, found that the relative risk of falling into poverty was about eight times lower than those who fell into poverty in 1994.

## Social Transfers

**What was the redistributive impact of social transfers?**<sup>6</sup> Social transfers had a positive redistributive impact during the transition period. This follows an overall increase in inequality during the early years of transition, when there was suddenly greater concentration of transfers on old-age pension benefits (Milanovic, 1998). However, during the period under analysis there was a trend toward better targeting. This trend is attributed to benefits other than pensions, since the distribution of old-age pension benefits remained practically unchanged during the period.<sup>7</sup>

**What accounts for this shift in the redistributive impact of social benefits?** As in other countries in Central and Eastern Europe, the objectives of the social transfer system under central planning did not include poverty alleviation. However, poverty increasingly became a key policy concern, especially as the early transition reforms were seen as adversely effecting large segments of the population. In 1993 the Labor Fund and Social Assistance programs were the only truly means-tested benefits (the beginning of the period under study). These were subsequently supplemented by a series of laws aiming at tying some existing universal benefits, including most of the programs labeled here family allowances and unemployment compensations, to the actual needs of the poor and vulnerable. In particular, the eligibility to unemployment compensations was gradually tightened and the effective replacement rate lowered.

Also, social benefits were increasingly better targeted (in a way comparable with other countries in the region, Rutkowski, ed., 1999 and Milanovic 1998b).<sup>8</sup> Social benefits accounted on average for one-quarter of income of chronically poor households during this period, compared to a 5 percent share in the income of non-poor. Among the social benefits, family benefits and unemployment compensation constituted the largest shares of transfers to the poor, exhibiting an upward linear trend that was similar to total benefits (Figure 1). More importantly, their contribution to the income of the chronically poor increased along with the number of years that the households spent in poverty. It rose from about 2.5 percent to about 10 percent of

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<sup>6</sup> The following programs provided social transfers to households in Poland in 1993-96: (a) family benefits, including child-related allowances such as the maternity allowance, the child-rearing allowance, an allowance for a dependent child; (b) care allowances that supplement either invalidity or retirement pensions (for a non-working family member); (c) other family allowances, including birth grants, state-paid alimony, and some assistance allowances such as sickness benefits for the unemployed or alimony for an adult member (for brevity, labeled from now on "other benefits"); (d) unemployment benefits, which includes unemployment compensation (their major component) and subsidies to unemployed people starting enterprises; and (e) miscellaneous local benefits, which include a variety of locally or centrally administered benefits in cash or in-kind such as state or charity support to the poor, transportation tickets, and partial payment of daycare center fees. Because most of them are administered locally, they are labeled from now on, as "local benefits."

<sup>7</sup> The Gini coefficient for the households that received pensions equaled 0.39 over the whole period, while the coefficient for all households was 0.68. At the level of individuals, the values oscillated between 0.25 and 0.24 for pensioners and 0.83 for all individuals in the sample. All of these figures were calculated on the basis of annual cross-sectional data.

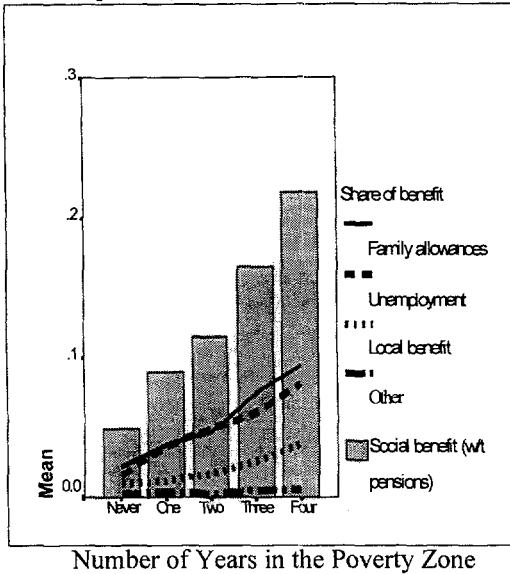
<sup>8</sup> Above 20 percent of the total social assistance went to the lowest decile, similar to Bulgaria (22.3 %) and Hungary (27 %) but lower than in Estonia (35 %) -- see Rutkowski, M., (ed., 1999) and Milanovic (1998b).



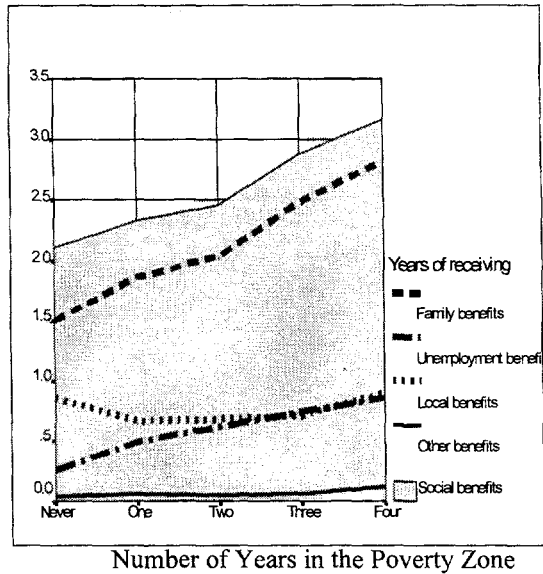
disposable income in the case of family allowances, and from 2 percent to 8 percent of disposable income in the case of unemployment compensations.

Indeed, there is a positive association between the number of year spent in poverty and the number of years receiving social benefits (Figure 2). This association is stronger for family benefits, which are the most important component of income for households experiencing poverty for a prolonged period of time. The association is not as strong for unemployment compensations, is less significant for other benefits, and simply non-significant for local benefits. It is important to note, however, that the poverty mitigating impact of these benefits differed between urban and rural households. Unemployment compensations had a stronger poverty mitigating effect on urban than on rural households, while family benefits had stronger effect on rural than on urban households.

**Figure 1: Share of income from social benefits in household disposable income, by number of years in the poverty zone**



**Figure 2: Average number of years of receiving benefits, by number of years in the poverty zone.**



Another way to examine the poverty mitigating effect of social benefits is to ask what would have happened to vulnerable households in case they had not received social benefits. Estimates for the 1993-96 period finds that 14 percent of households that were never poor would have fallen into the poverty – some of them for as long as three or four years. One-third of households who experienced poverty for one year would have stayed in poverty for at least one additional year. Social benefits, therefore, prevented at least one out of seven families (households) from falling into poverty, and reduced the length of time that poor households spent in the poverty zone by about one year.

**What was the impact of social benefits in reducing the time spent in poverty?** The impact of social benefits on reducing the length of poverty spell was significant but not dramatic (at least as far as median of the poverty spell distribution was used). When benefit-derived consumption was not taken into account, the median length of the poverty spells increased by about four months (from 22 to 26 months), or about 20 percent. This means that a change of one

percent in household disposable income due to an increase in social benefits would reduce the average time spent in poverty by nearly 2 percent. To reduce the average poverty spell to no longer than one year (or by 45 percent), social benefits would have to increase by about 13 percent.

Also, when only the recipients of benefits are taken into consideration, estimates indicate that an increase in the share of unemployment compensations in household disposable income has a slightly greater impact on reducing poverty spells than analogous change in family benefits. A one- percent increase in unemployment compensations would reduce the average poverty spell by 3 percent, against a 2 percent reduction in poverty spell that a one- percent increase in family benefits would yield. One important reason for this difference is that the unemployment compensations were better targeted and accounted for a higher share of recipient's income. Unemployment compensation accounted for about 11 percent of recipient's income, compared to about 5 percent for family benefits.

**What was the impact of social benefits in assisting families exit or avoid falling into poverty?** Social benefits played an important role in helping families exit poverty, but had less impact in preventing families from falling into poverty. Figure 3 shows the cumulative conditional probability that a family exited poverty after being in poverty for a given period. In the absence of social benefits, the rate of exit out of poverty would fall dramatically among vulnerable groups, including all types of families.

Figure 3 also shows that, among the poor, the lowest poverty exit rate was for families with three or more children, followed by "other" families with children (including single-parent families and grandparents with children). At the other extreme, the group of households that was best placed to exit chronic poverty was married couples without children and single-person households. Small nuclear families (with one or two children) and families without children fell in between these two extremes.

**Figure 3: Hazard Function for Exiting Poverty with and without Social Benefits, by Type of Family**

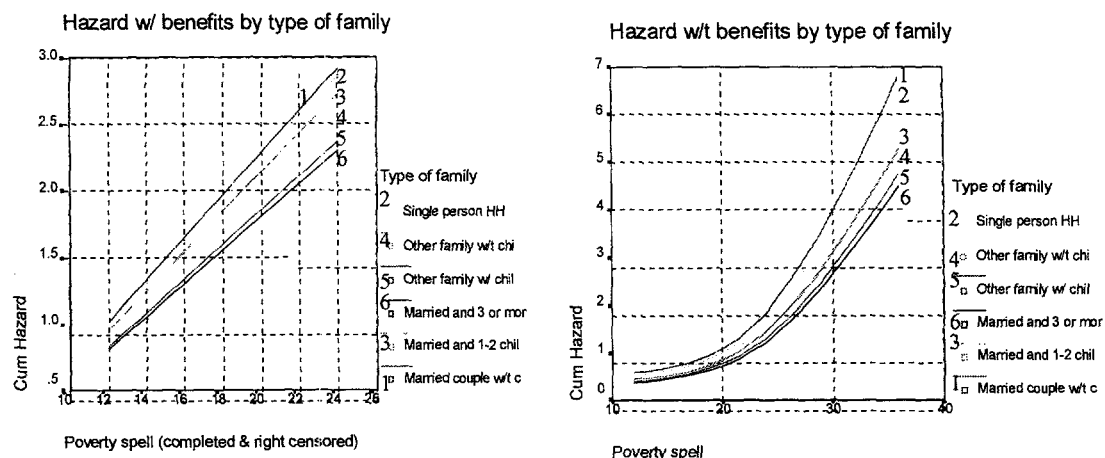
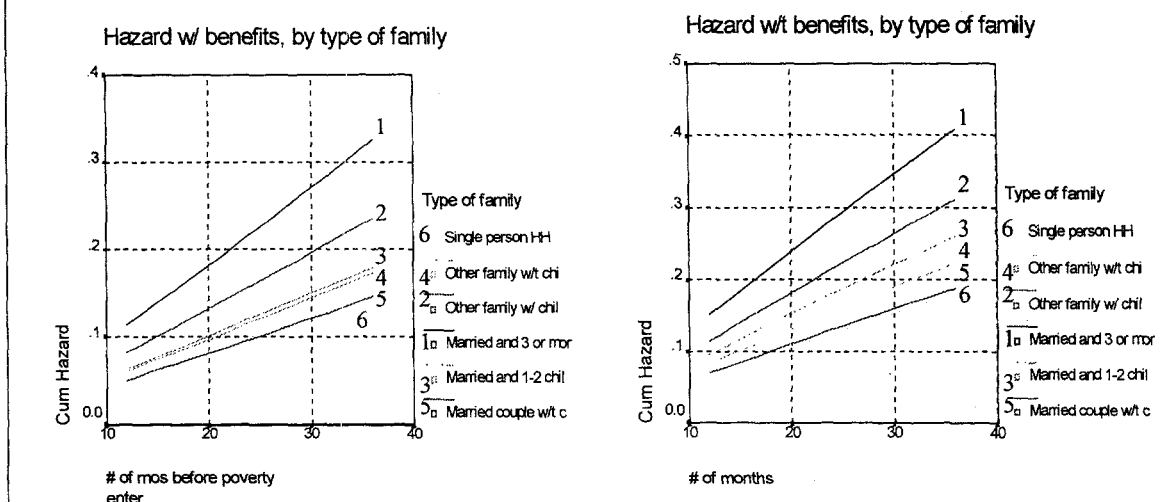


Figure 4 shows the cumulative probability of falling into poverty once benefits are withdrawn. In the absence of social benefits, the spread between the cumulative probabilities of falling into poverty increased among the different family types. Families with three or more children and single-parent families saw their risk of falling into poverty increase the most, while single-person households and childless married couples saw the smallest increase. Small nuclear families and families without children again fell in between these two extremes.

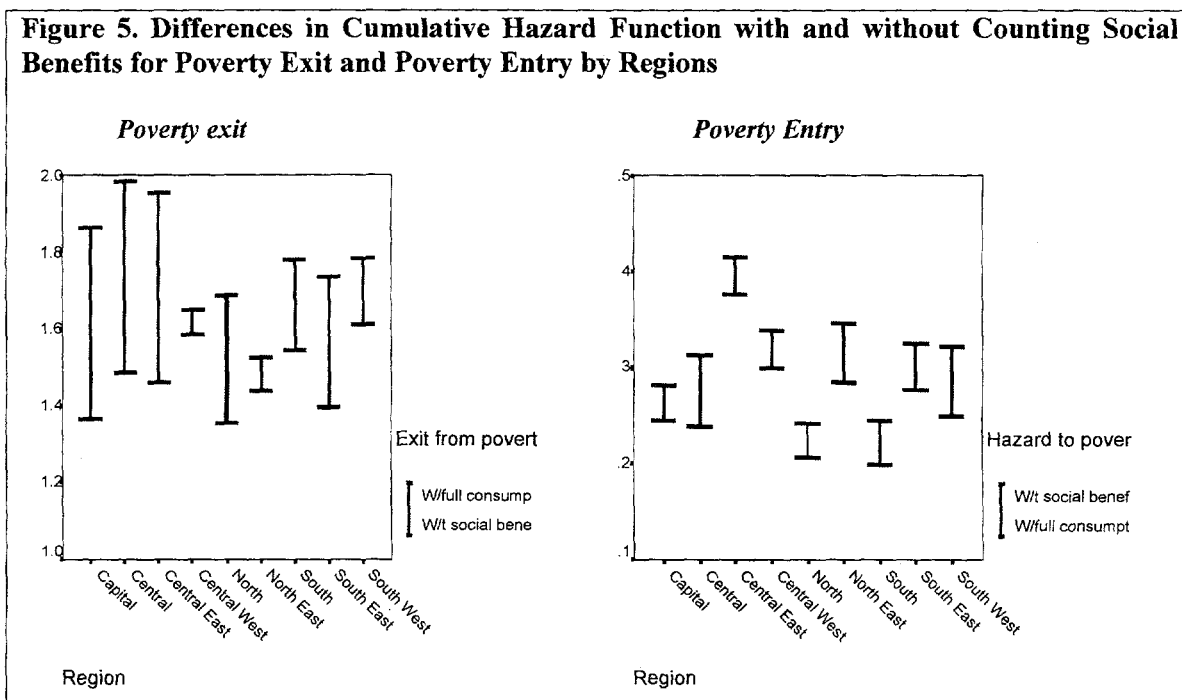
**Figure 4: Hazard Function for Falling into Poverty with and without Counting Social Benefits, by Type of Family**



**How was the impact of benefits on households' transition in and out of poverty differentiated across the regions?** The regional variation in the poverty exit rate was significantly affected by social benefits. Figure 5 shows that households in central regions have on average gained more than southern and eastern regions in terms of an increased chance of raising out of the poverty (as demonstrated by the differences in the cumulative hazard function between the situations 'with' and 'without' counting social benefits, respectively, for each region). The figure also shows that the regions are much more differentiated with respect to the households' risks of falling into poverty than their chances of exiting poverty (both 'with' and 'without' social benefits). For instance, households in North region are generally less endangered by poverty than households in eastern regions (especially, in Central East).

**How many households that fell into poverty were not captured by the social safety net?** One-fifth of the households in the sample reported not receiving any benefits (not counting pensions) during the four year period studied. Among these households, an astonishingly high rate, 29.7 percent, spent some time in poverty: 14 percent experienced one-year poverty, 9 percent experienced two-year poverty, 4 percent experienced three-year poverty, and 2.7 percent experienced four-year poverty. The households that fell between the cracks of the social safety net (the non-recipient poor) were concentrated in rural areas (65 percent), and about the same fraction (62 percent) constituted the households headed by persons with no school diploma (62 percent). There was also an overrepresentation of households headed by one-parent families and large families with children.

**What factors besides the social safety net helped mitigate long term poverty?** Two factors besides the social safety net contributed toward mitigating the risk of poverty and, to a lesser extent, repeated poverty for some households:



*Ownership of financial and physical assets, as well as access to credit.* Households that possessed financial assets, durable goods, or had access to credit, were better able to stay out of poverty. Households with saving accounts were less vulnerable and more likely to remain outside poverty than those without savings accounts. Households that possessed durable goods did sell some of these when they slipped into poverty. Households that borrowed or bought consumer goods on credit were better able to smooth consumption, even during periods of hardship. Indeed, the incidence of such transactions correlates significantly with chronic poverty and vulnerability, suggesting that these households took advantage of credits and loans -- both from commercial and private sources -- to maintain their current level of consumption rather than to augment their stock of assets.

*Inter-household transfers.* Most of the households were part of a larger kinship network, protecting them against repeated poverty and vulnerability in similar way as savings. Fifty-six percent of these households received a gift from another household, and 64 percent donated gifts to members of other households at least once during the four years in question. Not surprisingly, households that belonged to such networks faced significantly less danger of falling into chronic poverty. Inter-household transfers, however, did not replace public transfers. Inter-household transfers were important in preventing a recipient family from falling into poverty, while public social transfers had a stronger impact on increasing a household's chances of exiting poverty.

In general, both savings and credits as well as inter-household transfers, showed to be more significant in preventing families and individuals from falling into poverty than in helping the poor exit poverty (reflecting the fact that the poor are typically assetless). The public social transfers had, on the contrary, a decisively stronger impact on increasing a household's chances of exiting poverty (reflecting the fact that they constitute relatively larger part of the budget of those already in poverty).



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# THE DYNAMICS OF POVERTY AND THE EFFECTIVENESS OF POLAND'S SAFETY NET (1993-96)

## INTRODUCTION

The analysis in this paper is based on the construction of a four-year panel data set (from 1993 to 1996) from the Polish Household Budget Survey conducted annually by Central Statistical Office. The data were used to examine the key policy issues -- changes in the relative economic positions of Polish households<sup>9</sup> and the role of social policies in addressing long-term poverty during the period of economic recovery and growth.

Although social policy in Poland does not yet recognize the temporal heterogeneity of need,<sup>10</sup> it is essential to take this distinction into account in any comprehensive assessment of the performance of the existing safety net. In particular, it is relevant to show the major types of social benefits -- broadly defined family allowances and unemployment compensation -- have been performing in terms of moving the poor out of poverty or preventing vulnerable households from falling into the poverty zone. These two benefit programs account for the overwhelming majority of social insurance spending after excluding pensions (which counted for three-quarters of total cash social transfers). Since 1993, cash social spending has absorbed about one-fifth of Poland's GDP.<sup>11</sup>

The paper does not analyze pensions despite the fact that they constituted nearly three-quarters of all social spending (which, in total, absorbed one-fifth of GDP) during the period 1993 to 1996. The reason for this is that a pension is a long-term benefit awarded on the basis of a person's work history rather than a benefit of a limited duration given in response to a poverty-causing event or household characteristic. However, households headed by pensioners (either old-age pensioners or disability benefits recipients) are included, and no type of household is excluded from the analysis.<sup>12</sup>

As no "dynamic" evaluation of the performance of these programs has been attempted so far, most of the ongoing debate on the current Polish social insurance system has concentrated on two types of deficiencies. On the input side, the employers' premium is the main source of funding for the system (constituting 45 percent of total payroll of a company since 1992).<sup>13</sup> This means that, practically, the system lacks a sound financial foundation, which in turn results in

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<sup>9</sup> They are discussed in a more detailed way in a separate paper (Okrasa, 1999).

<sup>10</sup> This is also the case in most of OECD countries. For example, of those countries in the G-7 group, only in France does social policy explicitly recognize the distinction between the temporarily poor and the long-term poor (Duncan et al, 1993).

<sup>11</sup> This level of social spending is twice as high as before the transition (9.4 percent of GDP in 1988). It is also higher than equivalent outlays on benefits in other Central and Eastern European countries and in most OECD countries with only France with 21 percent and the Netherlands with 24.8 percent being bigger spenders (OECD, 1998).

<sup>12</sup> Also, as they are related neither to a need principle nor to a welfare-relevant characteristic of households, pensions are expected, on the basis of the results in Part I, to have a much smaller effect on poverty status over time than either unemployment or family benefits. The same is suggested by other studies, for instance, van de Walle et al (1994) on the impact of social benefits in Hungary.

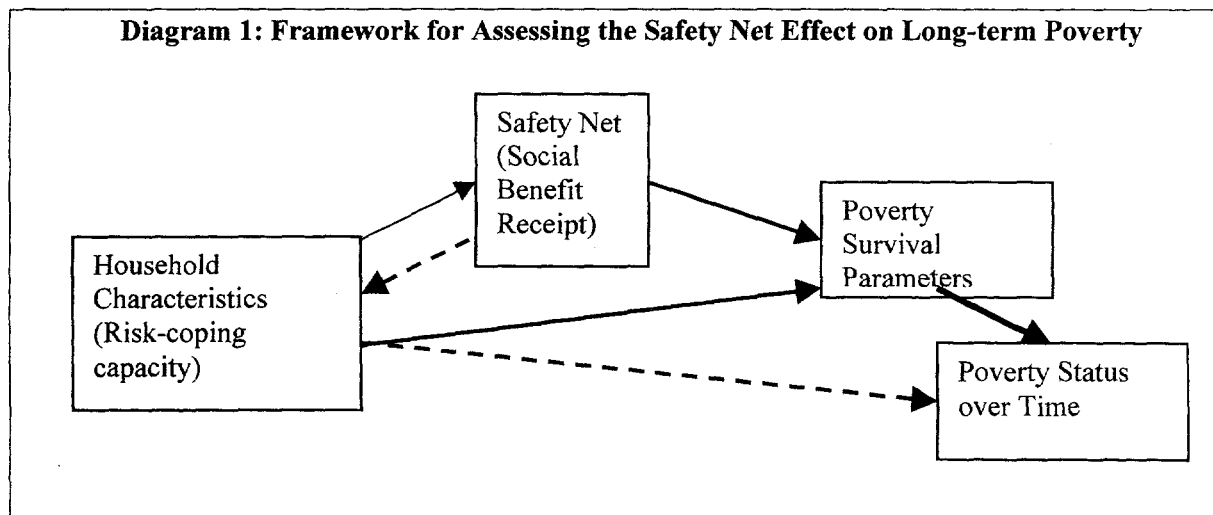
<sup>13</sup> This is the employers' contribution to the social security fund (ZUS). In addition, they have to pay 3 percent of their payroll to the Labor Fund and 0.18 percent to another benefit fund.

overburdened state budget. On the outcome side, the system is criticized for failing to achieve its redistributive and insurance objectives (see OECD, 1998).

The object of special interest in the paper relates to the fact that, for the most part, the different facets of the system have either been held over from the pre-transition era<sup>14</sup> or have essentially been “modernized” in an *ad hoc* fashion.<sup>15</sup> Although the safety net in Poland is considered to be better at protecting the poor in general than those in many other countries in the region (Grootaert and Braithwaite, 1998; Milanovic, 1998b; Rutkowski, 1999) this paper supports the view (which predominates among policymakers and experts in Poland) that it is necessary to take a more structural approach to reforming public spending programs. Only then will it be possible to ensure that these programs are fully oriented towards reducing the length of time that poor spent in poverty.

From a social policy standpoint, there is a need to know the extent to which variation in household poverty patterns over time is *ceteris paribus* due to the benefits allocation scheme compared to the extent to which it is due to the heterogeneity among households in terms of their capacity to deal with idiosyncratic shocks to their incomes. The latter issue was dealt with in the previous paper (Okrasa 1999), which searched for the determinants of chronic poverty without taking social policy interventions into account. While the effect of differences in the receipt of transfers among a given category of households will be discussed in the next subsections.

Both of these aspects of the evaluation of the safety net performance are addressed within a framework that integrates the dynamics of poverty and social benefit receipts with the fact that households have different needs and risk-coping capabilities. This framework is presented in diagram form below.



The analysis presented in this paper was conducted as follows. The impact of social benefits was assessed first in terms of the parameters of survival analysis such as survival

<sup>14</sup> For instance, such as traditional orientation of social programs on the so-called major socioeconomic groups, rather than on actual needs of families and individuals (treated, consequently, in a way not fully compatible with the principle of equity -- Okrasa, 1988).

<sup>15</sup> This was particularly noticeable in the series of legislative acts devoted to the pension indexation system -- which changed it from a price-based to a wage-related system -- or in the initial implementation of unemployment benefits, which (before being reformed during 1992-1993) provided a disincentive to working.

function, the hazard rate, and the average time of remaining in poverty. Next, the demographic characteristics of a household that may determine its poverty status over time (together with some economic and behavioral variables) were included into the regression analysis that aimed to identify the main *risk factors* of a household's poverty status over time. In the last part of the paper, the role played by non-income sources of welfare (such as whether the household has a savings account or access to formal or informal credit and loans) is discussed. [The issue of assets holding is largely neglected in research on poverty, not only in the case of Poland but in all of the other post-socialist economies in transition, and is only touched on here in order to show its importance in helping households to cope with risk.]<sup>16</sup>

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<sup>16</sup> Aggregate saving in the transitional economies is much better recognized in the literature as being largely determined by policy choices represented by the “aggregate liberalization index” developed by de Melo, Denizer, and Gelb (1996).

## PART I: SOCIAL TRANSFERS AND TEMPORAL ASPECTS OF POVERTY

### Introduction

Poverty reduction strategies are typically designed and evaluated on the basis of information about households and, particularly, about the poor, covering a time period limited to one year (which is a standard reference period for cross-sectional data). However, there is a growing awareness among policymakers and analysts that allocating adequate available resources to poor requires that those who remain in poverty from one year to the next should be distinguished from those who only experience poverty occasionally.<sup>17</sup>

Social transfers have had a redistributive impact during the transition period but in a rather counter-intuitive way. It transpires that transfers have been the main reason why overall income inequality has increased in Poland because of the increased concentration of pensions (Milanovic, 1998a).<sup>18</sup> Less is known about how well the transfers are targeted. Comparing the Gini coefficients for all households in the sample (0.59 in 1993 and 0.61 in 1996) with the coefficients for transfer recipients only (0.54 and 0.50 respectively) would suggest that there was a trend towards better targeting during 1993–96 compared to the previous few years. This trend should be attributed to benefits other than pensions, as the distribution of pensions remained practically unchanged during that period.<sup>19</sup> Compared to other countries, in terms of social assistance being received by the lowest decile, Poland (20.5 percent) is -- together with Bulgaria and Hungary -- somewhere between Russia (8.2 percent) and Estonia (34.7 percent; Milanovic, 1998b, Rutkowski, 1999).

As in all of the countries of Eastern Europe, the objectives of the social transfer system under central planning did not include the alleviation of poverty. However, poverty has increasingly become a key policy concern as the early reforms were seen to have an adverse effect on large segments of the population. The Labor Fund and Social Assistance programs were the only truly means-tested programs that existed in 1993 (the beginning of the period under study). They were subsequently supplemented by a series of laws that aimed to tie some existing universal-type benefits, including most of the programs labeled here family allowances and unemployment benefits, to the actual needs of the poor and vulnerable. In particular, unemployment benefits have undergone a spectacular evolution from being excessively liberal (when they were introduced in 1990) to the version that prevailed during 1993–96, which had tighter eligibility criteria and a lower effective replacement rate. These changes are briefly discussed in the next sub-section.

However, the performance of the safety net with regard to long-term poverty still remains to be assessed (Ruggles and Williams, 1989; Hill, 1992; and Jalan and Ravallion, 1998). This paper addressed this problem counter-factually by asking: What would have happened to households if they had not received a given type of benefit? Taking a micro-simulation approach

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<sup>17</sup> Analysts typically recommend adopting cash transfer programs aimed at the temporarily poor and special support programs to alter the long-term economic outlook of those who tend to remain poor from one year to the next (see Hill, 1992).

<sup>18</sup> Transfers contributed to inequality during the transition more than they did before the transition. In 1995, they contributed almost as much as income from wages and salaries did (Milanovic, 1998).

<sup>19</sup> The Gini coefficient for the households that received pensions equaled 0.39 over the whole period, while the coefficient for all households was 0.68. At the level of individuals, the values oscillated between 0.25 and 0.24 for pensioners and 0.83 for all individuals in the sample. All of these figures were calculated on the basis of annual cross-sectional data.

made it possible to generate the appropriate parameters under the assumption that households were not receiving either family benefits or unemployment compensation or all social benefits other than pensions. The effectiveness of each of the programs was assessed by comparing estimates of the respective parameters (such as the likelihood of a household leaving the poverty zone after a given period of time in poverty or of the risk of a household falling into the poverty zone) with baseline estimates representing the actual situation. The fact that households have different capabilities for managing the risk of chronic poverty should also be recognized in this context. Fortunately, the data used allow for heterogeneity of the sampled households with this respect.

### **Panel Data 1993 - 1996**

The data used in the analysis came from the Household Budget Survey, which is conducted annually by the Polish Central Statistical Office (GUS). The survey yields rich information on the income, expenditures, and demographic characteristics of households using a diary system of data collection from a nationwide probability sample of between 31,000 to 32,000 households.

The Household Budget Survey is a cross-sectional survey but has an explicit panel component (using a *split-panel* technique, Kordos, 1995). In the rotation of subsamples, exactly half of the households are surveyed in the same month during a period of four consecutive years. There were two panel segments used during the period 1992-96, one comprised of the households that participated in the survey from 1992 to 1995 and the second comprised of those that participated in it from 1993 to 1996. Therefore, the four-year panel 1993-96 embraces, theoretically, about one-quarter of the cross-sectional sample (instead of a half). However, due to cases of non-response and to attrition, the effective size of the four-year panel is 4,919 households.

While a typical annual non-response rate was about 31 percent from 1993 to 1996, the year-to-year attrition rate was about 12 percent during that period. This amounted to about 38 percent of total attrition among the households that were designated to participate in the survey from 1993 to 1996. The relatively highest rate of attrition was among the households classified as self-employed, while the lowest was among the households of farmers. For example, during 1995-96, their respective attrition rates were 14 percent and 9 percent (GUS, 1996).

In order to indicate the direction of any possible bias, one may compare the cross-sectional and panel observations by various major characteristics and measures. Such a comparison made in Okrasa (1999) showed that the differences between the cross-sectional and the panel data were, for the most part, not substantial (although, given the large size of the sample, they were often statistically significant). As expected, the panel data show a tendency to downward rather than upward bias in the possible estimates of welfare measures (reflecting the fact that relatively more affluent households are, on average, slightly less likely than poorer households to continue to participate in the survey over the long term).

### **Basic Definitions and Background**

*Poverty Pattern.* The full scope of possible situations that any given household may have faced during the four-year period in question consists of 16 different poverty patterns that are mutually exclusive and exhaustive. These are presented in Table A-1 in Appendix A.1<sup>1</sup>. The table contains frequency distributions of households by poverty patterns over the four-year period under the several alternative definitions of consumption used in this paper for determining household welfare -- with and without counting the household consumption that can be attributed

to, or derived from: (i) family benefits, (ii) unemployment benefits, and (iii) all social benefits other than pensions and disability benefits.<sup>20</sup>

At first glance, the differences between these distributions were large enough to prove that the social welfare system and each of its major components had a sizable impact on how often a household falls in, or how long it stays in poverty. However, leaving aside for the time being the assessment of how much social benefit a household receives, it was worth looking first into the overall effect of incidence of the transfers.

*Poverty Transition.* The transition in and out of poverty is unlikely ever to be a symmetrical process either in terms of households' abilities to cope with risk or in terms of the impact of social benefits. For instance, younger households may be more vulnerable to falling into poverty but not necessarily to remaining in it for a long period than older ones. Also, a particular type of social benefit may help poor households to lift themselves out of the poverty zone in a different way than the way in which it helps non-poor vulnerable households to remain outside of the poverty zone. Therefore, the two temporal aspects of poverty – poverty duration and poverty avoidance – must be taken into account when evaluating the performance of social transfers as they are associated both with two types of time-event observations (the outflow of households out of poverty and the inflow of households into poverty).

- *Poverty spell:* The duration of poverty refers to how long a household has been poor. This particularly applies to those households that were not poor at the beginning of the period in question, that became poor at some point during that period, and next either rose back out of poverty (poverty spell completed during the period of observation) or were still poor at the end of the period of observation. This analysis can be occasionally extended to also cover the left censored observations -- how long it takes for a household to rise out of poverty if it was already poor at the beginning of the observation period.
- *Poverty avoidance:* The avoidance of poverty refers to the “survival” status of those households who were not poor at the beginning of the period in question. Their “survival” meant as remaining outside the poverty zone constituted a complementary aspect (to the poverty duration and exit) in assessing the performance of the social safety net.

The distribution of the poverty patterns over time aggregated according to the main types of possible outcomes (poverty spell completed - poverty spell right censored - poverty spell left censored - poverty spell double censored - remaining outside poverty zone) by household vulnerability status is available from the author (or from the unit).

*Vulnerability status* of a household was defined here in the same way as in Okrasa (1999): for a household to be “vulnerable,” during the four years in question, there had to have been a systematic decline in either its income or its consumption (in terms of respective quintiles) or in just one of these measures if there had been no systematic increase in the other. Altogether, 31 percent of the sampled households was classified as vulnerable.

These two aspects of poverty over time may provide policymakers with a dilemma in designing an effective anti-poverty policy: To what extent should they focus on protecting the poor against remaining in prolonged poverty (for another year or more) as opposed to preventing vulnerable groups from falling into poverty? Therefore, this section analyzes in a parallel way

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<sup>20</sup> The benefit-derived consumption was calculated as the household's total consumption per equivalent adult multiplied by a factor equal to the share of income from social benefit program(s) in the household's total disposable income.

both of the possibly conflicting objectives (poverty exit and poverty avoidance) talking sometime, for the sake of brevity, about the *context of promotion* and the *context of prevention*, respectively.

#### Problem of Behavioral Response.

The assumption that a household's level of welfare as defined without benefit-derived consumption can, all other things being equal, be compared to its actual welfare also implicitly assumes that the effect of the household's behavioral responses is not discernible, and can be ignored in the analysis. In general, this is questionable, as discussed, for instance, by National Research Council (1991) or by van de Walle, Ravallion, and Datt (1994), and Atkinson (1998). When the amount of benefit received by a household or the scope of access it has to benefits is reduced, the household may compensate itself for the loss by changing its behavior. For example, it may send more of its members out to work or it may draw on savings, private transfers, or credits.<sup>21</sup>

There is some evidence that Polish households have been adjusting their behavior to the changes in either public or private transfers during the transition. For instance, increased job-seeking on the part of the unemployed was observed after restrictions were imposed on the eligibility, duration, and level of unemployment benefit in 1992-93 and in 1996 (Kalaska and Witkowski, 1997). Also, there was some evidence of inter-household transfers among worker households with transfers going predominantly from relatively better-off to poorer families (Cox, Jimenez, and Okrasa, 1997) -- which indicates that households do may change their behavior in response to changes in their benefits.<sup>22</sup>

Coming up with a fully satisfactory solution to this problem -- one that would involve identifying the appropriate behavioral response functions and generating variables projected forward in time for each social program -- remains beyond the objectives of this study. Instead, it was decided to test the robustness of estimates of the survival parameters to the possible effects of behavioral responses. This was done by estimating households' propensity to consume out of their social benefit payments (within an econometric model of consumption). This estimate was then used to generate new household welfare values ("without" benefits), which eventually yielded different poverty patterns over time to those in Table A-1 (Appendix A. The strategy used here partly followed the strategy that was originally used by van de Walle et al (1994).

*The Propensity to Finance Consumption out of Social Benefits.* The propensity of households to consume out of their social benefits (other than pensions) was estimated for consecutive pairs of years during 1993-96. The year-to-year changes in adult-equivalent consumption were regressed on changes in the household's income from social benefits and on lagged social benefits. Also included in the regression were a set of predictors representing the household's endowments in the basic year  $t$  and in terms of changes between  $t$  and  $t + 1$ , such as: (i) human capital in terms of the head's educational achievements and age and the household's composition; (ii) physical assets such as agricultural land or an allotment, durables, or amenities; and (iii) other characteristics of the household head such as gender, labor status, and sector of employment. The fixed effect model was assumed, but the same variables for the basic years were included in order to control for the different "initial conditions" (as discussed in Grootaert, Kanbur, and Oh, 1995). The results of this regression are presented in Table A-2 in Appendix A.

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<sup>21</sup> Poverty patterns over time "without" benefits were constructed in the same way as setting households' propensity to consume out of their social benefits as equal to unity. However, some households may have been able to save out of their benefits. However, due to the fact that pensions were not included in the analysis, the benefits were simply not large enough to allow households to save.

<sup>22</sup> However, those private transfers that, during the pre-transition time (according to data from 1987) functioned like public means-tested public transfers, showed a firm tendency to decline during the transition (according to data from 1992) -- see Cox et al, 1997.

In general, households' propensity to finance their consumption out of their lagged social benefits was practically negligible but was significant with respect to year-to-year changes in the level of benefits that they received. This propensity varied from 0.58 in 1993-94 to 0.67 in 1994-95 and to 0.40 in 1995-96. The lower propensity in 1995-96 is consistent with the earlier finding that social transfers represent a decreasing share of income in the sampled households.

However, the concern about bias in the assessment of the safety net performance was not so much about the level of propensity to consume out of social benefits (PCOB) in itself. What it was important to establish was whether the PCOB varied significantly among groups of households that exhibited different propensities to remain chronically poor – for instance, between households that differed in terms of their vulnerability status, locality, or the number of children under the age of 15. Therefore, the same model was re-run to estimate the PCOB for sub-groups of households divided according to these characteristics, which had already been shown to have a significant impact on household poverty status over time.

Contrary to expectations, the values of PCOB in the group of non-vulnerable households were somewhat higher than average in the sample, while, among vulnerable households, they were much smaller but not statistically significant. No consistent pattern of difference emerged from comparing urban and rural households; urban households had a slightly higher PCOB (above the average) during 1993-1994 and 1994-95 than rural households, while in 1995-96, the PCOB was higher among rural households. There was a rather surprising finding with regard to households with large numbers of children, which exhibited practically insignificant PCOBs. This was the case not only for those households with children under the age of 15 but also for those with children under the age of 18. (Only in the cases of households with three children in 1994-95 and households with four children in 1995-96 were the values statistically significant and above the average for these periods).

Leaving aside the substantive interpretation of these differences, as well as the information revealed by other variables' coefficients, these results suggested that vulnerability status was the only significant factor of a possible bias associated with the behavioral response effect. Therefore, in assessing whether the safety net is adequately meeting the needs of the long-term poor, it will be vital to take into account the distinction between vulnerable and non-vulnerable households in estimating survival parameters.

#### Transfer Incidence.

If social transfers contribute to a household's ability to either avoid or rise out of poverty, then it could be expected that there would be a higher incidence of social transfers among the poor and vulnerable households than among other households during the whole period being studied. It would also be reasonable to expect that benefits other than pensions account for a larger share of the total disposable income of the poorest households than of less poor or non-poor households ("more" and "less" poor refers to the number of years that the household had spent in poverty).

The information presented in Figures 1 and 2 below generally confirms these expectations. However, before discussing these figures, it is necessary to give a brief review of the benefits being analyzed.<sup>23</sup>

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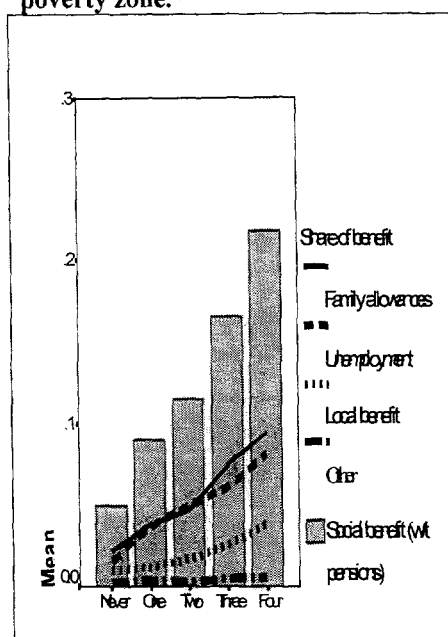
<sup>23</sup> Some restrictions are imposed on the analysis by the classification of social benefits that was used in the survey by GUS (the Central Statistical Office). For instance, social assistance (which has accounted for about 8 percent of social insurance since its introduction in 1991) and other allowances to the very poorest are combined with a variety of other benefits into one group (the "miscellaneous" category). In consequence, this last group of benefits will only occasionally be included in the analysis.



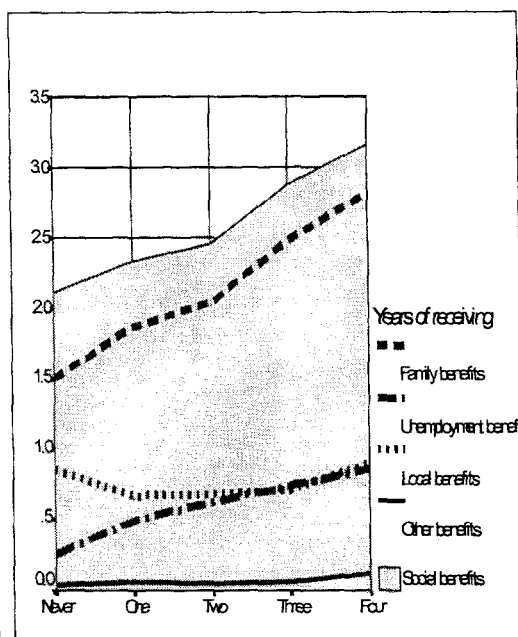
The following programs provided social transfers to households in Poland in 1993-96 (omitting retirement and disability pensions, which are not analyzed in this paper):

- *Family benefits*, which include (a) *child-related allowances* such as the maternity allowance, the child-rearing allowance, an allowance for a dependent child, and (b) *care allowances* that are a supplement to either invalidity or retirement pensions (for a non-working family member).
- *Other family allowances*, which include birth grants, state-paid alimony, and some assistance allowances such as sickness benefits for the unemployed or alimony for an adult member (for brevity, from now on, these are labeled “other benefits” or, in some exceptional cases, “social assistance”).
- *Unemployment benefits*, which include unemployment compensation (their major component) and subsidies to unemployed people starting enterprises.
- *Miscellaneous* (“local”) benefits, which include a variety of locally or centrally administered benefits in cash or in-kind such as state or charity support to the poor, transportation tickets, and partial payment of daycare center fees. Because most of them are administered locally, they are labeled from now on, as “local benefits.”

**Figure 1: Share of income from social benefits (w/t pensions) in household disposable income, by number of years in the poverty zone.**



**Figure 2: Average number of years of receiving benefit, by number of years in the poverty zone.**



Practically none of these benefit programs remained unchanged during the period in question (some details about these changes are in the technical notes).<sup>24 ii</sup> Because the benefits put such heavy pressure on the central government budget (accounting for about 5 percent of

<sup>24</sup> Detailed descriptions of social spending before 1993 can be found in Golinowska (1994), in Warsaw School of Economics (1994), and in World Bank (1994).

GDP each year since 1993), there have been a series of legislative efforts over the last few years aimed at reducing both family allowances and unemployment benefits, either by lowering their levels or by tightening their eligibility criteria.<sup>25</sup> On the other hand, the statistical classification of social programs that was used in the survey has been improved.<sup>iii</sup>

The share of benefits (other than pensions) in household disposable income per capita – calculated as averages over the four-year period – varied greatly across the welfare trajectory categories. According to Figure 1 below, all of these social benefits accounted for nearly one-quarter of the income of the poorest households (those that are permanently poor), while the share among those that had never been poor declined monotonously to about 5 percent.

Family allowances and unemployment compensation constituted the biggest shares of household income, and both exhibited linear trends that were similar to the trend exhibited by total benefits. Their shares increased along with the number of years that the households had spent in the poverty zone – from about 2.5 to about 10 percent (in the case of family allowances) and from 2 to 8 percent (in the case of unemployment benefits).

How is the size of the shares associated with transfer incidence? To some extent, this depends on what indicators of incidence are used. One way to capture social transfer incidence over time is to use a series of zero-one variables indicating whether or not a household had received any income from a given social program during the four-year period. About two-thirds (63 percent) of the households received family benefits for at least one out of the four years, while one-quarter (26 percent) received unemployment compensation and 41 percent received “local benefits.” Altogether, four out of five households (79.4 percent) received at least some benefits during one of four years.

According to Figure A-1 in Appendix A, the fractions of households receiving a given type of benefit during at least one out of four years tended to grow with the number of years the households had spent in the poverty zone. About 60 percent of non-poor households received family allowances, while over 80 percent of the poorest households received them. Also, the fraction of recipients of unemployment benefits ranged from about one-fifth of the non-poor to about half of the permanently poor. Only “local benefits” were more or less flat across all of the welfare groups.

A different aspect of transfer incidence was illustrated by the number of years during which a household had been receiving benefits from any program. The average time period during which households received any type of social benefit was 2.29 years, but this differed from program to program as follows (with years converted to months and standard deviations in parentheses): (i) family benefits - 21.1 months (19.4); (ii) unemployment benefit - 4.8 months (9.5); (iii) “local” benefits - 9.7 months (14.2); (iv) other benefits - 0.7 months (3.6).

As shown in Figure 2, these means also differed significantly among the various welfare groups, especially in the case of family benefits, which ranged from about 18 months for non-poor households to 34 months for the poorest households. Unemployment benefits ranged from

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<sup>25</sup> For instance, a policy lowering the maximum age of children attending school from 25 to 20 years of age for receipt of family allowances was enacted at the beginning of the period in question. However, only in March 1996 was the duration of the unemployment benefit adjusted to reflect the average duration of unemployment spells. The eligibility requirements for the unemployment benefit have been successively tightened since the benefit was first introduced. Together with the reduction in the duration of the benefit noted above, this lowered the fraction of benefit recipients among job-seekers from as high as 80 percent before the period in question (the highest being in 1991) to 30 percent afterwards (in 1997), well below the OECD average (OECD, 1998). The rate of unemployment has also successively declined (from 16.4 in 1993 to 13.6 in 1996).

about 2.5 for non-poor households to 9 months for the poorest households.<sup>26</sup> Unemployment benefits also differed significantly among different socioeconomic groups and types of families.<sup>iv</sup>

Since the data revealed that the length of time that households received social benefits was typically shorter than the length of time that households spent in chronic poverty, a question arises about how poverty and the receipt of social benefits are related. For instance, only 38 to 40 percent of unemployed people stayed out of work for longer than 12 months (Kalaska and Witkowski, 1997), while nearly two-thirds of the poor spent longer than one year in poverty. This issue is discussed in the next subsection.

### **Social Transfer Incidence and Chronic Poverty**

In order to answer the question of whether social programs take account of the dynamic nature of households' welfare, it was first used a proxy indication of whether or not any of the social programs matched households' economic status over time during the period in question.<sup>27</sup> In particular, did chronically poor households receive benefits more frequently or for longer periods of time than others? Also, how strongly was the period during which the household received particular types of benefits associated with the length of time that the household spent in poverty?

First, the effect of social benefits was examined through comparing the values of the coefficients of the regression with years in the poverty as the dependent variable that was run under alternative definitions of consumption (actual consumption and when benefit-derived consumption was not counted). The following variables were used as predictors: the number of head's school years, the number of years during which an unemployed person was present in the households (during the analyzed period), the number of children under 15, while controlling for urban-rural distinction and for region (using nine dummies). The results presented in Table A-3a in Appendix A suggest that the role of the schooling increased (by about 18 percent) if social benefits were not counted. [For instance, with each year of schooling of the household head lowered, the household would have stayed for about one-fifth time longer in poverty after the social benefits were removed compared to when social benefits are counted -- the respective coefficients are -0.148 and -0.175.)] But the most sizeable was the increase of the impact of the unemployment incidence in the household in the case when unemployment benefit was not counted (by nearly 80 percent), followed by about one-fourth greater impact of the number of children in the pre-school age if family benefit was not counted.

Two measures of program participation were used in the preliminary examination of patterns of social benefits receipts among households with different poverty statuses over time – (i) the number of social programs from which a household benefited during the four-year period and (ii) the number of years during which it participated in each program (years-in-program). It was expected that poorer households, as measured by the length of time they had spent in the poverty zone, would be more dependent than other households on social programs.

The results of regressing the number of years in poverty on the number of years-in-program – presented in Table A-3b of Appendix A – were consistent with a tendency to the linear association between these variables demonstrated by Figures 1 and 2. The values of the t-statistics – predominantly positive and highly significant – indicated that households in prolonged poverty

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<sup>26</sup> The duration of benefits as approximated here (all measures are assumed to have a one-year reference period) does not reflect the actual duration of the benefits.

<sup>27</sup> The importance of proxy measures in assessing the performance of a social program was demonstrated by Grosh (1994).

generally benefited from more programs and for longer periods of time. This proved to be the case both when the benefits were aggregated and when the major programs were treated separately, except in the case of “local” benefits. The distinctions between urban and rural households and between vulnerable and non-vulnerable households made the association between program participation and the time spent in poverty even clearer.

Family allowances (restricted here to the i-aggregate listed above) appeared to be the most important component of the income of households who were experiencing poverty for a longer period of time. Unemployment benefits were shown to be slightly less important in this respect, followed by the residual category of “other” benefits. Both unemployment and “other” benefits exhibited more difference between urban and rural households and between vulnerable and non-vulnerable households than with family allowances.

If a negative association, such as the one shown by local benefits, was significant (which was significant only in the case of the non-vulnerable households), this suggests that the poor had less access to these benefits than the non-poor.

*Asset Holdings.* The issue of the availability of various resources and the access that different households have to them requires examining so-called non-income sources of welfare. Households may not be forced to reduce their consumption, and to fall into poverty if they have accumulated asset holdings or borrowed funds. Thus, it could be expected that a household’s access to such sources would be inversely related to the number of years it had spent in poverty. Generally, the patterns of association shown at the bottom of Table A- 3 in Appendix A confirm this expectation.

The number of years during which a household was able to rely on its own asset holdings – dissaving or credit from a financial institution – reduced the length of its poverty spells significantly. This accords with the commonly recognized fact that poor households with no assets are less likely than other households to have any savings and, therefore, are likely to have less access to institutional credit. They also have less possibility of borrowing money against their future labor income than other households as they are more likely to be liquidity constrained. In contrast to savings and formal credits, the positive and significant association shown by informal credits suggests that low-income households had been borrowing more extensively from private (informal) sources than from financial institutions but, as indicated by their welfare status, not in sufficient amounts to offset the decline in their consumption. Nevertheless, these private sources of borrowing tend to play the same role in the lives of poor households as social programs in that households see them both as a kind of rescue strategy. These tendencies are practically the same among urban and rural households and among vulnerable and non-vulnerable households.

A more comprehensive, albeit still preliminary, picture of the relationship between social benefits and poverty status over time was given by the results of regressing the years-in-poverty on years-in-program, while controlling for each other in a multiple regression model as follows:

$$\text{Poverty\_years} = 0.279 + 0.259(\text{Family\_year}) + 0.298(\text{Unemployment\_year}) \\ - 0.007(\text{Local\_year}) + 0.159(\text{Other\_year})$$

When, instead of years of program participation, a set of the dummy variables was included indicating whether or not a program was used by the household for at least one out of four years, the following estimates were obtained:

$$\text{Poverty\_years} = 0.480 + 0.299(\text{Family\_benefit}) + 0.605(\text{Unemployment\_benefit}) \\ - 0.007(\text{Local\_benefit}) + 0.188(\text{Other\_benefit})$$

The estimated coefficients of these two equations were fairly consistent with each other. This suggests that both types of information -- the number of years of receiving benefits and the fact that a household used the program at least once out of the four years in question -- would yield similar predictions about the length of the time a household was likely to remain in poverty.<sup>28</sup> Once again, “local” benefit incidence had practically no relevance for long-term poverty (as no significant association was shown between it and the number of years in poverty).

The more detailed results of these regressions, presented in Table A-4 in Appendix A, make it possible to examine some of the differences between urban and rural households and between vulnerable and non-vulnerable households. On average, unemployment benefits had a greater impact (in terms of the number of years of receiving benefits and the fact that a household used the program at least once out of the four years in question) on urban than on rural households, while family benefits tended to affect rural households (in the same terms) to a greater extent than urban households. However, these differences were too small to be generalized. The “local” and “other” benefits were either insignificant or barely significant in terms of the urban-rural distinction.

Urban and rural households (whose shares of social benefits in household welfare were practically the same) did not differ in terms of how their transfer incidence affected their poverty status over time. However, the impact was stronger among the vulnerable households (which are over-represented in rural areas) than among non-vulnerable households.

The fact that vulnerable households received a higher share of their income from social benefits than other households (taken with the characteristics associated with their vulnerability status as discussed in the previous section) explains why the number of participation-years in a program has a stronger association with the number of years spent in poverty in the case of vulnerable households.<sup>29</sup>

The amount of transfers (as opposed to their incidence) was taken into account in the calculations in the form of an adjustment factor as described previously in a footnote (in connection with Table A-1 in Appendix A). The original measure of welfare (adult-equivalent consumption) once transformed by such an adjustment factor generates a new distribution of households on the welfare scale.

It might be expected that the scope of the resulting changes in household positions in the distribution might be larger among those with bigger portion of consumption derived from the benefits. The shares of benefit-derived consumption in total household-equivalent consumption (including, as previously, all benefits except retirement pensions and disability benefits) are presented in Figure A-2 in Appendix A. These shares increased as the number of years in poverty increased, which was also the observed trend for the share of social benefits in total income (Figure 1). The share of benefit-derived consumption in total household-equivalent consumption was bigger by a factor of five among the permanently poor than among those households that had never been poor. However, within each of the year-in-poverty groups, the share — and the welfare impact of social benefits — decreased over the period in question. This observation is

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<sup>28</sup> Both models are statistically significant (at the level of 0.001). The t-values are also significant for each coefficient at the level 0.01, except for local benefits which were significant at the level 0.05.

<sup>29</sup> From 1993 to 1996, the shares of benefits in household welfare (as measured by the size of social benefit-derived consumption compared with total household consumption per equivalent adult) ranged between 7 and 9 percent in the case of urban households and between 8 and 10 percent in the case of rural households. The analogous numbers varied between 11 and 12 percent among vulnerable households compared with 5 to 9 percent for non-vulnerable households. Both of the major programs — family allowances and unemployment benefits — exhibited this tendency.

consistent with the apparent trend of declining household dependency on income from social transfers (for example, as might be seen by looking at income composition by poverty pattern and the high share of earnings in the income of the poorest as discussed in Okrasa, 1999).

Aggregated social benefits (without pensions) had a significant effect in terms of reducing poverty among all groups. This is shown in Figure A-3 in Appendix A, which illustrates what would have happened if benefit-derived consumption had not been accounted for in the model. For instance, 15 percent of those households that were never poor would have fallen into the poverty zone – some of them for as long as three or four years – if benefit-derived consumption had not been included. One-third of those households who had experienced poverty for one year would have stayed in poverty for at least one additional year without benefits. In other words, social benefits can be said to have prevented at least one out of seven families (households) from falling into poverty, while also reducing the length of time that poor households spent in the poverty zone by about a year.

A complementary exercise was conducted, which compared the composition of the social benefits received by households with different poverty patterns over time (results are available from the author). When those households that had never been poor were omitted, the most dissimilar patterns of social benefits composition were exhibited by households that fell into and rose out of poverty during the period in question and those with a double-censored poverty spell (the permanently poor plus most of those in recurrent poverty). The share of benefits in total income was about twice as low in the case of those who either avoided poverty at all or completed a poverty spell within the four-year period as the share of those with a double-censored poverty spell. The composition of social benefits received by those who were already poor when they entered the study and those who were in the poverty zone at the end of the period was almost identical. They differed from other groups of households by having a higher share of unemployment benefits, which indicates that unemployment was the chief cause of their poverty.

## PART II: THE POVERTY SURVIVAL EFFECT OF SOCIAL BENEFITS

### Introduction

In order to assess the effectiveness of the social safety net in preventing households from falling into poverty and helping the poor to escape from poverty, it was necessary to use a model that made it possible to estimate the key quantities that describe the process of *falling into* and *moving out* of the poverty zone. Changes in the appropriate parameters of long-term poverty that can be attributed to social transfers can be used to appraise their impact on the household poverty status over time. From a policy standpoint, it is important to know what changes have occurred in: (i) the length of household poverty spells; (ii) the likelihood of exiting poverty after spending a given length of time in it; (iii) the likelihood of surviving outside of the poverty zone; (iv) the risk of households falling into poverty; and (v) the risk of households remaining in poverty for a longer period of time. For this purpose, survival analysis techniques seemed to be especially suitable, first, because of the genuinely censored nature of the observations provided by the survey panel data<sup>30</sup> and because standard regression techniques that require "normal" (uncensored) data would produce biased results.

### Model Selection and Assumptions Made

A two-stage approach was undertaken. The objective of the first step was to find out whether or not social transfers were meeting the needs of the chronically poor. The second step involved identifying the factors that were responsible for changing the poverty status of different groups of households over time.

*Social Benefits and Poverty Survival Parameters.* The first stage involved assessing how social benefits affect the respective survival parameters listed above (from i to v) under alternative definitions of household welfare -- with and without counting the consumption derived from social benefits. At this stage, social benefits, either aggregated or as individual programs taken separately, were assumed to be the only factor responsible for the differences in the poverty status over time.<sup>31</sup> Thus, the survival function and the hazard rate were the basic quantities used to describe poverty as a time-to-event phenomenon. The conditional probability that a household that remained ("survived") in poverty until just prior to time  $t$  and rose out of poverty at the same time interval was the basic quantity from which estimators were constructed of the survival function and the (cumulative) hazard rate as well as of the (partial) likelihood function.<sup>32</sup>

Remaining at the intuitive level, the concrete meaning of each of these quantities was provided by the definition of the *end event*.<sup>32</sup> The *Life Tables* procedures were used for this

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<sup>30</sup> As is demonstrated in Table 1 in Appendix A, only some of the poverty patterns consisted of spells that had begun and ended during the period covered by the data (most of them are either right-censored or left-censored, and some are double-censored observations).

<sup>31</sup> In other words, the issue is to analyze the differences between the distributions of poverty patterns presented by different columns of Table A-1 in Appendix A. The differences are envisioned as the effect of changes that receiving the benefits have made in a household's welfare status over time, in other words, under the counterfactual scenarios that they were not counted in the household consumption (per adult equivalent).

<sup>32</sup> When the end event is meant to be rising out of poverty, the survival function represents the risk of remaining in poverty for another year or for several more months (for computational convenience, months units are used instead of years). When the end event is meant to be falling into poverty after staying out of the poverty zone, survival has its usual denotation.

purpose (using the SPSS program to do the calculations). For this, three basic variables had to be constructed -- a *survival variable*, a *time interval*, and the *survival status* for a particular observation (or outcome variable) associated with the survival variable.<sup>vi</sup>

The basic data expression for a household sample of size  $n$  consisted of the triple  $(T_j, \delta_j, \mathbf{Z}_j(t)), j = 1, \dots, n$  where  $T_j$  was the time that the  $j$ th household spent in the panel for the survey,  $\delta_j$  was the poverty-event indicator (either to enter or exit the poverty zone, depending on the context of the analysis --  $\delta_j = 1$  if the event had occurred and  $\delta_j = 0$  otherwise, including a right-censored observation), and  $\mathbf{Z}_j(t) = (Z_{j1}(t), \dots, Z_{jp}(t))'$  was the vector of covariates (potential risk factors) for the  $j$ th household at time  $t$ , which may have affected the survival distribution of  $X$ , which represented the poverty pattern over time. Leaving aside for the time being a detailed discussion of the covariates (which will be done later as part of the further specification of the model in the results section), the actual form of the covariates that were used here was  $\mathbf{Z}_j(t) = \mathbf{Z}_j = (Z_{j1}, \dots, Z_{jp})'$ . This means that the time-dependent covariates were excluded as the analysis was aimed at predicting risk factors for a household's poverty status over time in terms of the time-invariant attributes of the household or the household's situation.

Formally, in the case of outflows from poverty, the survival function was defined as the probability of a household "surviving" (remaining) in the poverty zone beyond time  $t$ :  $S(t) = \Pr(T > t) = \sum_{t_j > t} p(t_j)$ , where  $T$  was the time until the household exited poverty (the *duration of stay* in poverty or the *duration of occupancy*) and was assumed to be a non-negative, discrete random variable from a homogenous population, and  $p(t_i) = \Pr(T = t_i)$ , was the probability mass function, estimated as the probability per unit time (per one month) of a household exiting the poverty zone within the interval  $t$ , where  $t = 1, \dots, 4$ . For the discrete random variable, such as the four time intervals used here, which were each 12 months long,  $S(t)$  was the probability of the household being in the poverty zone at the end of the interval. If  $T$  was treated as a continuous random variable, the survival function was a complement of the cumulative distribution function:  $S(t) = 1 - F(t)$ , where  $F(t) = \Pr(T \leq t)$ .<sup>33</sup>

$S^0(t)$  and  $S^1(t)$  denoted the values of the survival function when benefit-derived consumption was included and when household consumption was reduced by not counting benefits in the definition of the household welfare status respectively. In the case of outflows from the poverty zone, the inequality  $S^0(t) < S^1(t)$  meant that a given type of benefit had the effect of helping households to move out of poverty. Analogously in the case of inflows into the poverty zone,  $S^0(t) > S^1(t)$  meant that a transfer had the effect of preventing households from falling into the poverty zone.

Of particular interest here are, however, the chances of a poor household exiting the poverty zone in the next instant. This was represented by the hazard function,  $h(t)$ , that was more informative than the survival function about the underlying mechanism of exiting poverty.

The hazard rate is defined as the conditional probability of a household exiting poverty within the time interval (of length  $\Delta t$  after  $t$ ) given that it occupied the state of poverty for a time  $t$  was defined as:

$$h(t) = \lim_{\Delta t \rightarrow 0} \frac{\Pr(t \leq T < t + \Delta t \mid T \geq t)}{\Delta t}$$

<sup>33</sup> See Klein and Moeschberger (1997) and Lancaster (1990) for details.



In other word, it is the instantaneous rate of rising out of poverty per unit time period at  $t$ .<sup>34</sup>

When the duration of being in poverty,  $T$ , is treated as a discrete random variable (as in this study), the value of the discrete-time hazard at the time point  $t_j$  can be given by

$$\begin{aligned} h(t_j) &= \Pr(\text{exit at } t_j \mid \text{survival to } t_j) \\ &= \Pr(T = t_j \mid T \geq t_j) = p(t_j) / S(t_{j-1}); \quad j = 1, 2, \dots, M \end{aligned}$$

where  $S(t_0) = 1$ , and  $p(t_j)$  was the discrete probability mass function at  $t_j$ , which was the estimated probability per unit time of exiting poverty in the interval; and  $M$  was the number of isolated times (months) in which the exit could occur.

Analogously to the case of survival function, the hazard rates calculated with and without the benefits were compared in order to assess the impact of a given type of transfer program. For those in poverty, the inequality  $h^o(t_j) > h^r(t_j)$  would mean that the benefits helped them to exit poverty, while for the non-poor  $h^o(t_j) < h^r(t_j)$  would mean that the benefits were affecting their risk of falling into poverty helping them to avoid falling into poverty?

Since vulnerable households had consistently been shown to be more likely to suffer from chronic poverty and to have less of a chance of rising out of it than non-vulnerable households, both the survival functions and the hazard rates were, for most cases, calculated for these two strata (for vulnerable and non-vulnerable households). This was also a way of “neutralizing” the possible effect of the behavioral response (as discussed in the previous section). So, in fact, what was compared were the values  $S_v^o(t)$  with  $S_v^r(t)$  and  $h_v(t_j)$  with  $h_v^r(t_j)$ , where  $v$  stood for the strata -- in the case of a household’s vulnerability status,  $v = 1, 2$ , but other strata were also occasionally used in this analysis, such as groups distinguished by their level of welfare dependency.

A summary version of the two measures -- the cumulative survival function and the cumulative hazard function -- are useful for making a graphic representation of the risk to households of remaining in prolonged poverty or their chances of exiting poverty respectively. The variable representing the proportion of households that “survived” in poverty for a particular length of time was estimated as a product of the probabilities of survival up to and including the current interval. The cumulative hazard function (rate), which is more often used, was given as a sum of the  $h(t_j)$ , that is,  $H(t) = \sum_{t_j \leq t} h(t_j)$ .

*Determinants of Poverty and the Dynamics of Social Transfers.* Having assessed the overall impact of the safety net and its particular components on the poverty status of households over time, the next stage of the analysis aimed to identify the factors that are responsible for differences in the poverty status over time among different groups of households. These factors were sought from among policy-relevant socioeconomic and demographic characteristics, while controlling for households' welfare dependency levels. The issue at the second stage, therefore, was to model the conditional hazard rate as a function of those characteristics that were included as covariates in the appropriate model. The aim of this was to predict risk factors for households falling into and rising out of poverty. The model that was chosen to achieve this aim was a *multiplicative hazard model* (of the family of Cox regression models).<sup>35</sup>

<sup>34</sup> Alternatively,  $h(t) \Delta t$  can be interpreted as the “approximate” probability of a household rising out of poverty in the next instant, conditional on the household still being poor at  $t$ .

<sup>35</sup> Calculations were made using Coxreg procedures in SPSS. An extension of the linear regression approach (as in the previous section where the number of years in poverty was the dependent variable) but with the natural logarithm of the survival time as the dependent variable could be used instead of the

Both the cumulative survival function and the hazard rate were estimated within the model relating the vector of covariates to poverty survival. The hazard rate was of most use in this case because the main aim was to assess how the chances of a household exiting poverty or the risk of it falling into poverty were influenced by household characteristics (in other words, which of these characteristics were the most significant risk factors). The hazard rate was defined as a product of the baseline hazard rate and the Cox function of the covariates as follows:

$$h(t | Z) = h_0(t) \exp(\sum_{j=1}^k \beta_j Z_j)$$

where  $h_0(t)$  was the baseline hazard function and  $Z$  was a vector of covariates.<sup>36</sup>

Because these household characteristics were included, the model not only yielded more precious hazard rates than those yielded by the Life Tables procedures but also made it possible to test hypotheses about relationships between the household's characteristics and its survival parameters (that is, the chances of it exiting poverty or the risk of it falling into poverty).<sup>37</sup> For instance, although both the educational achievement of the head and the type of family significantly affected the number of years that the household spent in the poverty zone, they may have had different effects on the household's entry into and exit poverty, especially when analyzed in combination with a given type of benefits.

Given the significantly lower return to education among poor households as opposed to the average in the sample (as discussed in Okrasa, 1994), it would be reasonable to expect that education would affect a household's ability to avoid falling into poverty more than it would affect its chances of exiting the poverty zone. In addition, this effect may be different when education was analyzed in combination with unemployment benefits than with family benefits.<sup>38</sup> Alternatively, the type of family variable may be more important for explaining a household's ability to exit poverty than their ability to avoid it, which may be a stronger effect in the case of family benefits than unemployment compensation.

The substantive aspects of the model, as well as the time-related status of the particular regressors – constituting a time-invariant covariate vector<sup>vii</sup> – will be discussed in Part V, after this section has examined how changes in social benefits affect poverty survival parameters.

In order to assess how social benefits interact with the household-level factors, the hazard rates (for exiting poverty), which were calculated under the full consumption-based definition of the poverty status over time,  $h^o(t | Z)$ , were compared with those calculated for household welfare without family benefits being counted, without unemployment compensation being counted, and with neither of them being counted --  $h^r(t | Z)$  with  $r$  referring to one of these three situations (with reduced consumption). It was assumed that  $h^o(t | Z) > h^r(t | Z)$  and, therefore,  $\Delta(h) = h^o(t | Z) - h^r(t | Z)$  was used as a measure of the impact of social benefits on the household's poverty status over time. Strictly similar reasoning was applied to the case of inflows into the poverty

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multiplicative hazard model but only under a specific assumption about the error distribution -- see Klein and Moeschberger (1997) for details.

<sup>36</sup> When the cumulative survival function is the dependent variable, the estimated model is:  $S(t | Z) = [S_0(t)]^{\exp(\beta_1 Z_1 + \dots + \beta_k Z_k)}$ , where  $S_0(t)$  is the baseline survival function that depends only on time.

<sup>37</sup> Since the hazard rate is in this case not a probability but the rate of the occurrence of the "end event" per unit of time, it does not need to be less than 1.

<sup>38</sup> Although unemployment benefits are flat rate payments, such expectations (although treated here as only an example rather than a substantive hypothesis) may be supported by a closer connection between education and employment status than is the case with family benefits.

zone but, of course, with reversed signs of the inequality between the survival quantities for the “with” and “without” benefits situations.

Also, as in the previous case, the household’s vulnerability status, which has been shown to have significant influence on poverty status over time, was used as the major stratum. Consequently, the model as actually estimated was slightly different, namely:

$$h_v(t | Z) = h_{0,v}(t | Z) e^{(BZ_1 + \dots + BZ_k)}$$

where subscript  $v$  referred to the hazard function for the  $v^{\text{th}}$  stratum ( $v = 1, 2$  in the case of vulnerability).

Another important feature of the model used here was that it was *the proportional hazard model*. In other words, the baseline hazard was shifted by a constant factor that represented the impact of the covariates. Therefore, the ratio of the hazard rates of two households with different degrees of vulnerability was assumed to be a constant for all time points.<sup>39</sup> The assumption that the baseline hazard functions were proportional was tested using the log-minus-log (LML) survival plot (for demonstrating that the lines for both strata were parallel).<sup>40</sup>

### The Duration of Poverty Spells

Before analyzing how *much* social benefit each household received, it was decided to explore further the patterns of social transfer incidence in relation to the survival parameters. First of all, how was the degree of welfare dependency that households experienced associated with the average length of a poverty spell? (This question is essentially a continuation of the questions discussed in Part III.) In addition, what role did households’ accumulated asset holdings and borrowed funds play in lifting or keeping them out of poverty?

*Welfare Dependency and Poverty Duration.* Generally, the social transfer incidence and the relative size of benefits in household welfare can be expected to be significantly associated with a household’s poverty status over time but to demonstrate opposite patterns of the association to each other. The reason is that, all other things being equal, low-income households with a large share of benefit-derived consumption in their total consumption should increase their ability to cope with risk by more than other poor households as reflected by spending less time in poverty or having a greater chance of rising out of it.

Comparing the duration of poverty spells among households with a given level of the *welfare dependency* can be done on the basis either of the number of *programs* from which the household benefited or of the number of *years* that it had benefited from the program(s). When the first criterion was used, a household was considered to be highly welfare-dependent if it received support from each of the following three major types of programs during at least one out of the four years in question: family benefits (including both child-related and other family allowances); unemployment compensation; and local benefits. For a household to be classified as having low dependency, it must have received benefits from only one program, while

<sup>39</sup> Despite some restrictions associated with these assumptions, they have computational advantages and provide simple tools for checking whether the distinction between two or more groups is associated with the respective chances or risks in a similar way (in the form of the requirement that their cumulative hazard rates should not cross). Otherwise, they should be treated within separate models.

<sup>40</sup> Although this is discussed in the results section (below), it can be said in advance that the model stratified by vulnerability status meets the condition of the proportional hazard model. It holds both in a general case as well as when the two groups (vulnerable and non-vulnerable households) are disaggregated by some important characteristics, such as family type or the welfare dependency level.

medium dependency meant that it had received benefits from any two of the three programs. When the second criterion was used, welfare dependency was indicated by the number of years during which the household had participated in a given program, ranging from zero to four years (the highest) for each of the three programs.

Using the first indicator of the welfare dependency, the median poverty spell duration was estimated by survival analysis (using Life Table techniques). The results of this estimation are presented in Table B-1a. in Appendix B. The table contains the results for: (i) those households that became poor during the period being studied and (ii) those that were already poor at the beginning of the period being studied ('poverty spell left censored'). As expected, the social transfer incidence and the poverty spell duration coincided with each other – they both occur to a higher degree among the poor than among the non-poor. The more welfare-dependent households (in other words, those that received benefits from all of the social programs) stayed in the poverty zone, on average, longer than the other households. However, the differences were modest, especially among those who became poor during the studied period – here the difference was only up to three months. The differences were much bigger between non-recipients (who received no benefits from any program) and recipient households among those households that were already poor at the beginning of the period (left censored).

Also, the effect of the welfare dependency level was somewhat more discernible among those who were poor from the start of the period in urban areas than those in the same situation in rural areas. This indicates that the length of poverty spell was less responsive to transfer incidence in rural than in urban households. It may be noted that, among the one-fifth of the sampled households (in the panel) who did not report any benefits during the four years, the fraction of those who experienced some form of poverty was astonishingly high -- 30 percent.<sup>41</sup> They constitute 16 percent of ever poor during the period under study (totaled at 1,906 households). Taking this fraction as an estimate of the analogous fraction in the population (the poor not receiving any social benefits) it would produce a substantial number of about 700,000 households (or about 2,2 million of individuals) of not covered by any form of social assistance.

The second indicator of household welfare dependency -- the number of years during which the household had received benefits -- showed a similar tendency as demonstrated by the results in Table B-1b in Appendix B. When attention was limited to the poverty spells that began during the period being studied, the median time in the poverty zone tended to be higher among those households (both urban and rural) that received family benefits for a long period. However, the pattern of unemployment benefits was mixed.<sup>42</sup>

The survival function and the hazard rate (not shown in Table B-1b, but are available from the author) behaved accordingly, in that recipient households were found to be more likely to remain in prolonged poverty. They also had less chance (a lower hazard rate) of rising out of poverty, and the difference increased with the duration of the poverty spell. The opposite pattern was observed in terms of the chance of avoiding poverty. Those households that were more

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<sup>41</sup> From among 1013 households (out of 4,919) who reported receiving no income from social transfers other than pensions during 1993-96, there were 305 suffering some form of poverty (out of 1,906 ever poor during that period); these 30.1 percent of the poor-without-benefits include 14 percent of poor for one-year, 9 percent poor for two years, 4 percent poor for three years, and 2.7 percent permanently poor (four-years).

<sup>42</sup> Urban households receiving unemployment benefits for more than two years spent a declining number of months in poverty, while rural households showed the same trend after three years. In other words, the long-term presence of a registered unemployed person in the household did not necessarily mean that it was poorer than other households, including those with no unemployed member. This may reflect the complicated nature of the relationship between a household's welfare and the unemployment status of its members (for example, an unemployment turnover among the members of the better-off multi-earner households – this it was discussed earlier).

dependent on social benefits had a lower probability of surviving outside the poverty zone than others. At the same time, they faced a much higher risk of falling into the poverty zone.

The findings regarding the duration of households' poverty spells and the risks of them becoming poor or rising out of poverty can be summarized as follows: the tendency for a household to remain in the poverty zone for a longer period of time coincided with it having a higher welfare dependency (as defined either as the number of *programs* from which the household benefited or of the number of *years* during which it had benefited from them). More dependent households also had less of chance of exiting poverty and a bigger risk of falling into poverty.

This result seems to support the contention that the distribution of social benefits in Poland generally accords with the distribution of households' needs relative to their welfare status over time. However, to find out precisely how much a household depends on social transfers, it is necessary to look beyond incidence to the *amount* of benefits that the household receives. This will be discussed later in this section, after an examination of the role that non-income sources of household welfare played in helping households to avoid poverty, escape poverty, and limit the duration of their poverty spells.

*Non-income Sources of Welfare.* Consumption-based measures of household welfare do not necessarily exhaust, nor are they limited to, the household's disposable income. It was shown in the previous section that households' accumulated asset holdings and borrowed funds may play an important role in terms of their poverty status over time. Thus, some important policy questions arise about how far does relying on savings or borrowed money strengthens a household's ability to manage its long-term poverty problem? In particular, do asset holdings and borrowed funds play a bigger role in helping a household to maintain its consumption level during a poverty spell or during the time when it is not poor? In other words, are they more important for helping the poor to rise out of poverty or for preventing vulnerable households from falling into poverty?

According to the results of survival analysis (which are only summarized here), the use of these assets or borrowed funds was associated both with a decrease in the risk of remaining in poverty and with an increased chance of rising out of it.<sup>43</sup> The median time spent in poverty was slightly more than 23 months for households without non-income sources of welfare, while it was 21 months among recipients of all three kinds of sources (savings, formal and informal credits or loans).

However, the overall effect of these non-income sources of welfare in helping households to rise out of poverty was rather modest, and was much smaller than the effect of social benefits incidence. This accords with the observation that was made earlier that the poor, even those who report using such non-income sources, have hardly any assets and have little access to formal credit.

Nevertheless, in contrast to their limited role in promoting the poor from poverty, asset holdings and borrowing contributed significantly to a household's ability to avoid poverty. However, there was, again, a difference between informal credit and the other sources. Money borrowed from private sources showed a similar pattern as social transfers, which was that the borrowers faced a higher risk of falling into poverty than other households. The supposition that low-income households turn to private, informal loans as their last hope for avoiding poverty is

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<sup>43</sup> The effect of alternative sources of maintenance on households' poverty status was not analyzed, mostly because they are, in general, not considered to be a part of income and cannot be incorporated into the analysis by the consumption adjustment factor defined previously.

supported also by the fact that borrowers were over-represented among the poorest households, with 35 percent of the permanently poor borrowing from private sources compared with 24 percent among the richest (those that had never been poor).

While social benefits were more effective in helping people to rise out of poverty, financial assets were a more effective tool than social benefits in preventing households from falling into long-term poverty. In other words, households that had accumulated asset holdings or that had borrowed money had much bigger chance of remaining out of poverty than those households that had no access to such sources. They were also less likely to remain in prolonged poverty (but this effect was weaker).

### **The Dynamics of Poverty and Social Benefits**

This subsection examines the effect of the *amount* of benefits received by the household on the duration of time that it spent in poverty (the context of promotion) and on the duration of time that it managed to survive outside the poverty zone (the context of prevention).

*Benefits and the chance of exiting poverty.* The overall impact of social benefits on long-term poverty, in terms of reduction of the length of poverty spell, was significant but not dramatically big (partly, due to using median for describing them). This impact is illustrated by the median time of remaining in the poverty zone as seen in Table B-2 in Appendix B. When benefit-derived consumption was not taken into account, the median length of the poverty spells increased by about four months -- from one year and ten months to two years and two months (roughly by about one-fifth). This means that a change of 1 percent in household disposable income due to social benefits (given that they account on average for about 10 percent of household income) would induce a nearly 2 percent change in the average time spent by households in the poverty zone. In other words, it may be noted that, in order to reduce the average duration of poverty in the population to up to one year (or by 45 percent), social benefits would have to be increased (in terms of their share of household income and assuming no changes had been made in the way they are distributed) by about 13 percent.

These proportions differ considerably between family benefits and unemployment benefits. Taking recipient households alone (meaning a household that received a given type of benefits during at least one of the four years being studied), it was estimated that a 1 percent change in shares of family benefits (which accounted for about 5 percent of household income) would yield a change of slightly more than 2 percent in the average duration of poverty. In the case of unemployment benefits (which accounted for about 11 percent of the income of recipient households), a 1 percent change would yield a 3 percent change in the average duration of poverty.

These findings firmly demonstrate that the long-term poverty effects of social benefits depend both on their level and on the way in which they are distributed. At a given level of benefits, the larger the fraction of households that received a particular type of benefit, the smaller the difference between the survival quantities calculated for the recipient households and for all of the sampled households. These calculations are presented in the columns labeled "recipient" and "all" in Table B-2 in Appendix B. They made it possible to compare in a preliminary way the importance of benefit-derived consumption for poverty duration. The difference between the two columns was especially apparent when all social benefits were compared with unemployment benefits. All benefits were received by 80 percent of households,<sup>44</sup> while the cumulative fraction of those that reported receiving income from unemployment

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<sup>44</sup> The recipient fraction among urban households was higher (82 percent) than among rural households (75 percent).

benefits during at least one of the four years was about 25 percent (though in none of the four years did the fraction exceed 10 percent).

The place of the residence did not significantly affect the median length of poverty spells as far as aggregated benefits were concerned (with the rural poor appearing to be only slightly less affected than the urban poor).<sup>45</sup> However, location had a stronger impact when unemployment benefits and family allowances were treated separately, though only in the case of recipient households. If the share of unemployment benefits in household income were increased by 1 percent, this would reduce the average length of poverty for the urban poor by 3.3 percent and for the rural poor by 1.8 percent. Alternatively, according to Table B-2 in Appendix B, if unemployment benefits were withdrawn, this would increase the length of poverty by half a year for urban households and by about 4.5 months for rural households. The analogous figures for family allowances were more differentiated between the poor in urban and rural areas -- 3.8 percent and 1.9 percent respectively. However, family allowances accounted for a slightly higher proportion of the income of rural households (6.8 percent) than of urban households (5.5 percent), while the shares of unemployment benefits in the income of urban and rural recipients were practically identical.

In contrast, a household's vulnerability status made a big difference, regardless of whether or not benefit-derived consumption was taken into account. In both cases, vulnerable households were likely to stay longer in the poverty zone (for nearly half a year) than the others. Vulnerability status appears to be more important with respect to family benefits than to unemployment benefits. Among recipients of unemployment compensation, the length of poverty spells estimated for vulnerable and non-vulnerable households was only about two months, whereas the difference between vulnerable and non-vulnerable households in the whole sample was about half a year. This accords with the observation that withdrawing these benefits would prolong the length of a household's poverty spell by a larger factor (about one-third) than if it was due to the household's vulnerability status alone (about one-quarter). One reason for this may lie in the fact that recipients of unemployment benefits were generally more vulnerable than the others (included in the "all" column).<sup>46</sup> Another reason may be associated with the fact (which was discussed above) that the average length of time during which a household received unemployment benefits was much shorter than the average length of time for receiving family benefits.<sup>viii</sup>

The degree to which the poverty survival parameters differed between vulnerable and non-vulnerable households can be interpreted as an indication of the sensitivity of a program to the long-term economic outlook of the poor household. Vulnerable households may have a different intensity of either moving out of poverty or falling into poverty (albeit the difference was not big enough to violate the assumption of the employed proportional hazard model, as discussed below). The relative importance of a household's vulnerability status in this context was examined by testing differences between the mean social benefits received by vulnerable and non-vulnerable households. [Detailed information is available from the author.]

According to the F-test, vulnerable households received a slightly higher level of both family allowances and unemployment benefits than non-vulnerable households (though the differences are barely significant at the level of 0.05) during each year except 1993 (in which there was no significant difference). The two groups received "local" benefits and other

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<sup>45</sup> However, in rural areas, the average level of total social benefits per capita was lower by about 20 percent during the four-year period, except in 1996 when it was almost equal to that in urban areas. The rural-urban differences in the average level of local benefits and unemployment compensation were bigger.

<sup>46</sup> While, recipients of unemployment benefits are somewhat more vulnerable (38 percent) than recipients of family benefits (34 percent), the fraction of vulnerable households that receive unemployment benefits is small (31 percent) compared to vulnerable recipients of family benefits (70 percent).

allowances at practically the same level. However, no intelligible pattern emerged from comparing the levels of benefits (either aggregated or separate) received by households categorized by their poverty status, regardless of whether or not the household's vulnerability status was taken into account.<sup>ix</sup>

To translate these results into an appraisal of the performance of the safety net, it may be concluded that, as far as average amounts of benefits are concerned, neither vulnerability nor poverty status over time is crucially important for the way in which social benefits are distributed among recipient households. In other words, the benefits might be received at similar levels by different categories of households – occasionally and chronically poor as well as non-poor – and can be used for different purposes, ranging from rising out of poverty to avoiding poverty. Nevertheless, these benefits could still have had a substantial distributional impact with respect to either of these aims if the recipients of the benefit were concentrated around the poverty line in each of the four consecutive years. This is why it seemed appropriate to suspend judgment about the safety net's performance until it has been tested for its impact on households' transitions in and out of poverty.

Changes in a household's risk of remaining in poverty and in its chances of rising out of it (that is, in the survival function and the hazard rate) provide more accurate and reliable information about how benefits affect poverty status over time than can be gleaned from the median length of poverty spells. These data are presented in Table B-4 in Appendix B. The changes clearly showed the same trend as the length of time in poverty, as discussed above, and they were sizeable.

The results in the columns labeled "survival function" reflect the cumulative proportions of households that "survived" at the end of a given year in poverty. These results clearly show that the risk of a household remaining in poverty beyond that time period (especially after having been poor for one year already) would be significantly larger if benefit-derived consumption was not included in the calculation of household welfare. Also, the difference between the baseline estimates with total consumption and those without a given type of benefits was roughly proportional to the share of that benefit in the disposable income of the recipient households. This explains the finding that unemployment benefits had a generally greater impact than family benefits.<sup>47</sup>

At the same time, the probability of a household rising out of poverty within a given 12-month period, as expressed by the hazard rate, was substantially smaller when social benefits were not counted. For instance, the chance of a household exiting poverty after one year decreased (from full consumption-based household welfare) by a factor of two when unemployment compensation was not counted and by a factor of one and half when family benefits were not counted.<sup>x</sup> [Detail information is available from the author.]

If it is assumed that social policymakers are likely to be interested in the relative impact of the particular components of the existing safety net, then two questions arise. First, how effective is a given type of program in helping the poor to rise out of poverty after a defined period of time? Second, how sensitive is the program to differences in the long-term economic outlook of households as indicated by their vulnerability status?

The hazard rate appears to be the most appropriate measure for addressing these questions as depicted in Figure 3. The curves depict the poverty exit rates over time in the baseline case and in the case of the major types of social benefits (all benefits, family benefits, or

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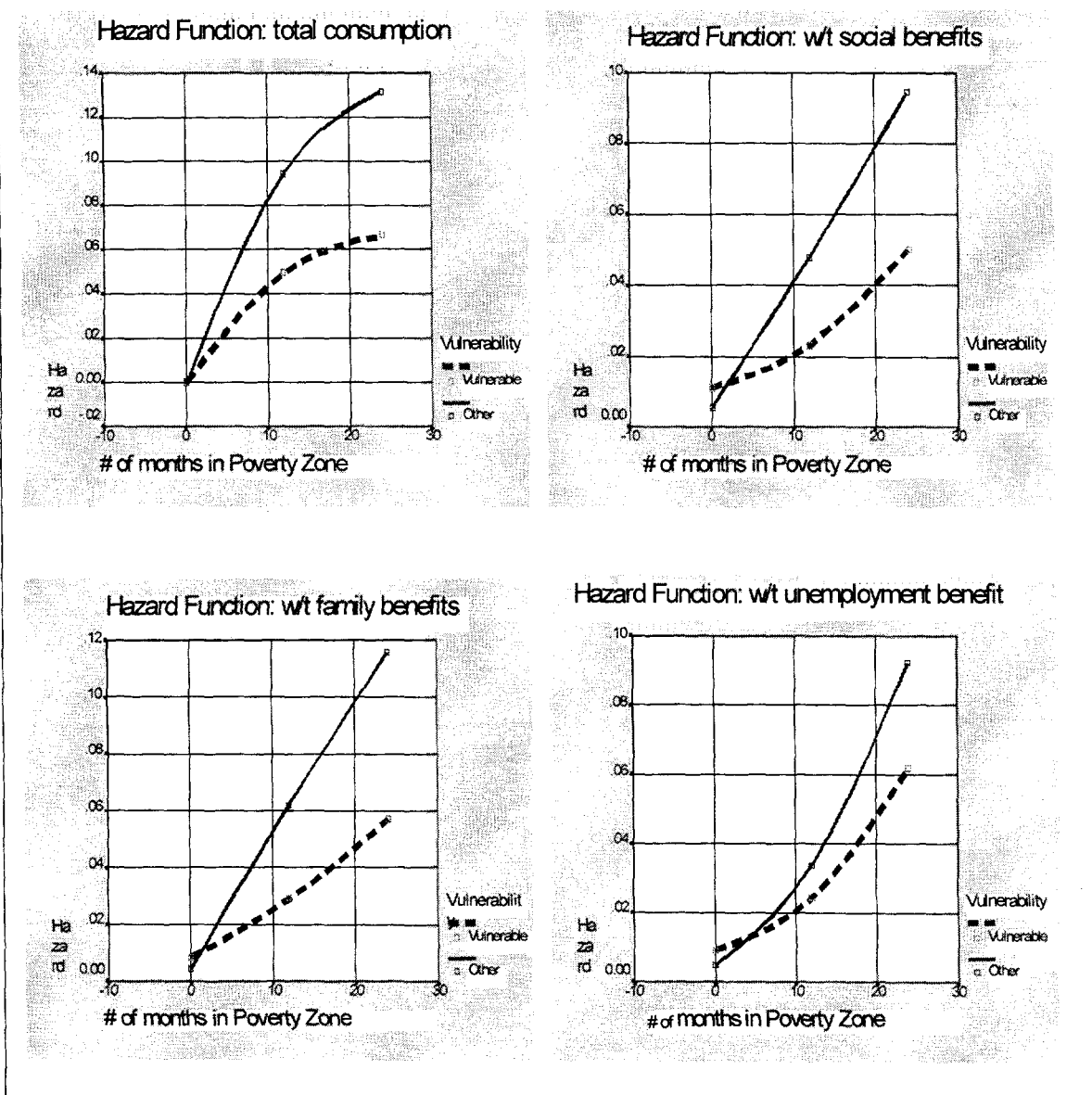
<sup>47</sup> In the further analysis, the aggregate "family allowances" was meant to include the residual "other" family benefits (which constitute about 10 to 15 percent of this aggregate).



unemployment compensation) with households stratified by their vulnerability status. The distance from the baseline estimates of the hazard rate calculated for each of these three cases represents their impact on a poor household's chances of rising out of poverty after being poor for a given 12-month period.

At first glance, the changes in the shapes of the hazard functions instantly brought to light the profound differences in poverty exit rates over time between the “with” and “without” benefit situations. The differences became even more apparent when vulnerability status was included. The shape of the graph changed from a irregular hump-shaped concave downwards curve in the baseline case to a concave upwards curve when benefit-derived consumption was not counted. This indicates that social transfers caused a dramatic increase in vulnerable households' chances of rising out of poverty.

**Figure 3: Poverty Exit -- Hazard Rate under Alternative Definitions of Household Consumption (calculated both with and without benefit-derived consumption)**



For instance, when benefit-derived consumption was not counted, vulnerable households had only half the chance of rising out of poverty after one year than in the baseline case, while the

chance for non-vulnerable households was reduced by only about one-third compared with the baseline case. This means that, when all benefits were withdrawn, a poor and vulnerable household had about the same exit rate after completing its first year in poverty as a non-vulnerable household would have had if it had stayed in poverty for another year. In practice, this is consistent with the difference between occasional and chronic poverty expressed in terms of the changes in risk that may be attributed to social benefits.<sup>48</sup>

The chances of rising out of poverty would be reduced at each point in time if benefit-derived consumption was not counted, but those in prolonged poverty would be in particular jeopardy because the differences between vulnerable and non-vulnerable households grew as the amount of time in poverty increased. For example, for non-vulnerable households in their 20<sup>th</sup> month of poverty, the increase in the exit rate due to benefits ranged from 20 to above 40 percentage points for family benefits and unemployment benefits respectively. The chances of vulnerable households rising out of poverty changed even more than those of non-vulnerable households when benefit-derived consumption was not counted (being almost half of the chances in the baseline situation). Family benefits had only a slightly larger impact than unemployment benefits.

One reason for the difference in the impact of unemployment and family benefits relates to their different criteria regarding eligibility and duration. Another reason relates the fact that unemployment benefits were more concentrated and paid at a generally higher level than family benefits to the recipient households. From 1993 onwards, the payments were, on average, higher to non-vulnerable than to vulnerable households. The opposite was true for all households – family benefits were generally higher than unemployment benefits, which were given at a somewhat higher level to the vulnerable.

In contrast to the case of family benefits, it cannot be assumed that the number of recipients of unemployment benefits and the number of unemployed (whether or not they are registered as unemployed) are the same. People may cease to receive the benefits (even though they continue to be unemployed) when their spell of unemployment has exceeded the maximum duration allowed. In fact, about one-third of the sampled households who reported having an unemployed member did not receive unemployment benefits in each of the four years in the study (and the figures were the same in both urban and rural areas).<sup>xi</sup>

This corresponds with the findings of Cazes and Scarpetta (1998) that many people without unemployment benefits leave the unemployment register to the inactive status rather than to employment. Leaving aside the possibility that they may be in “hidden” employment in the informal sector (despite that its size was shrinking during 1993-96 -- Johnson, Kaufmann and Shleifer, 1997; Jakobiak and Jeznach 1999<sup>49</sup>) this also means that this hypothetical situation of being “without” unemployment benefits may actually be experienced by many recipient

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<sup>48</sup> If the baseline model was estimated only for recipient households, the differences between hazard rates for the “with” and “without” benefits cases would be only slightly changed, depending on how concentrated or scattered “all” benefits are among the recipients of a particular program. Since the results only for recipients were not significantly different from the presented above, they are not included in this part of the discussion.

<sup>49</sup> The informal sector in Poland increased at the beginning of the transition accounting for about one-fourth of the economy (24 percent in 199, same level as in Russia, but smaller than in Hungary with 33 percent) but has systematically been declining since then to 12.6 percent in 1995 (compared to 42 percent in Russia and 29 percent in Hungary -- see Johnson, Kaufmann, and Shleifer (1997); according to GUS's estimates (Jakobiak and Jeznach, 1999), the rate of decline was somewhat lower with indication on unregistered employment as responsible for about one-third of the total value of the 'shadow economy' (retail trade accounted for nearly half of the GNP produced in the 'shadow economy', 47 percent, followed by construction, 17 percent).

households whose unemployed members have ceased to receive benefits but are still without a job. (This may also be a reason why the distinction between vulnerable and non-vulnerable households was less important in the case of unemployment benefits than in that of family benefits).

In general, social benefits had a significant impact on outflows from poverty by reducing the average length of time that households spent in the poverty zone and by increasing their chances of exiting the poverty zone. These effects were slightly bigger in the case of unemployment benefits than in the case of family benefits. The impact was rather sensitive to the household's long-term economic outlook as the benefits operate to the advantage of vulnerable households more than the others (especially in connection with family benefits, because the difference was somewhat lower in the case of unemployment benefits).

*Benefits and the Chance of Avoiding Poverty.* The next important issue was to find out how effective the social safety net was in preventing households from falling into poverty. This meant including the household's vulnerability status, which, in a static type of poverty analysis, typically is conceived as a configuration of certain characteristics that make a household more likely than other households to fall into poverty.<sup>50</sup> However, the focus of this analysis was on those households that were non-poor at the beginning of the period being studied and either became poor during that period or continued to be non-poor.<sup>xii</sup> In consequence, evaluating the performance of the social safety net involved assessing its effectiveness not only in helping households of the first group to postpone falling into poverty but also in helping households of the second group to avoid it successfully.<sup>51</sup> The first aspect of avoiding poverty (surviving outside the poverty zone) was examined by comparing households' survival functions, while the hazard rate was used for analyzing the transition into poverty during the studied period.

In general, social benefits were found to have a preventive impact in helping households to remain out of poverty, according to the values of the survival functions presented in Table B-5 in Appendix B. The benefits contributed significantly to an increase in the probability of remaining out of poverty, and by the same token, to the length of time a household remained outside the poverty zone. This was true for all households in the sample and specifically for the benefit recipient households. The emerging pattern was consistent across different time periods and types of social programs. At each point in time, the benefit-derived consumption contributed to the probability that a household would survive outside the poverty zone.

However, it should be borne in mind that the survival parameters here have an opposite meaning to the meaning that they had in the discussion of the role of benefits in helping households to rise out of poverty. In this case, the survival function represents the household's chances of avoiding poverty, and the hazard represents the risk of it falling into poverty. Thus, the overall contribution of social benefits to preventing households from falling into poverty was smaller than their contribution to helping the poor to avoid staying in the poverty zone for a long period of time.<sup>xiii</sup> Unemployment benefits had a greater effect in terms of helping households to stay out of poverty than family benefits. They were also more responsive to changes in the household's welfare position over time, which can be seen by the fact that they had a much bigger impact on vulnerable households than on non-vulnerable households.

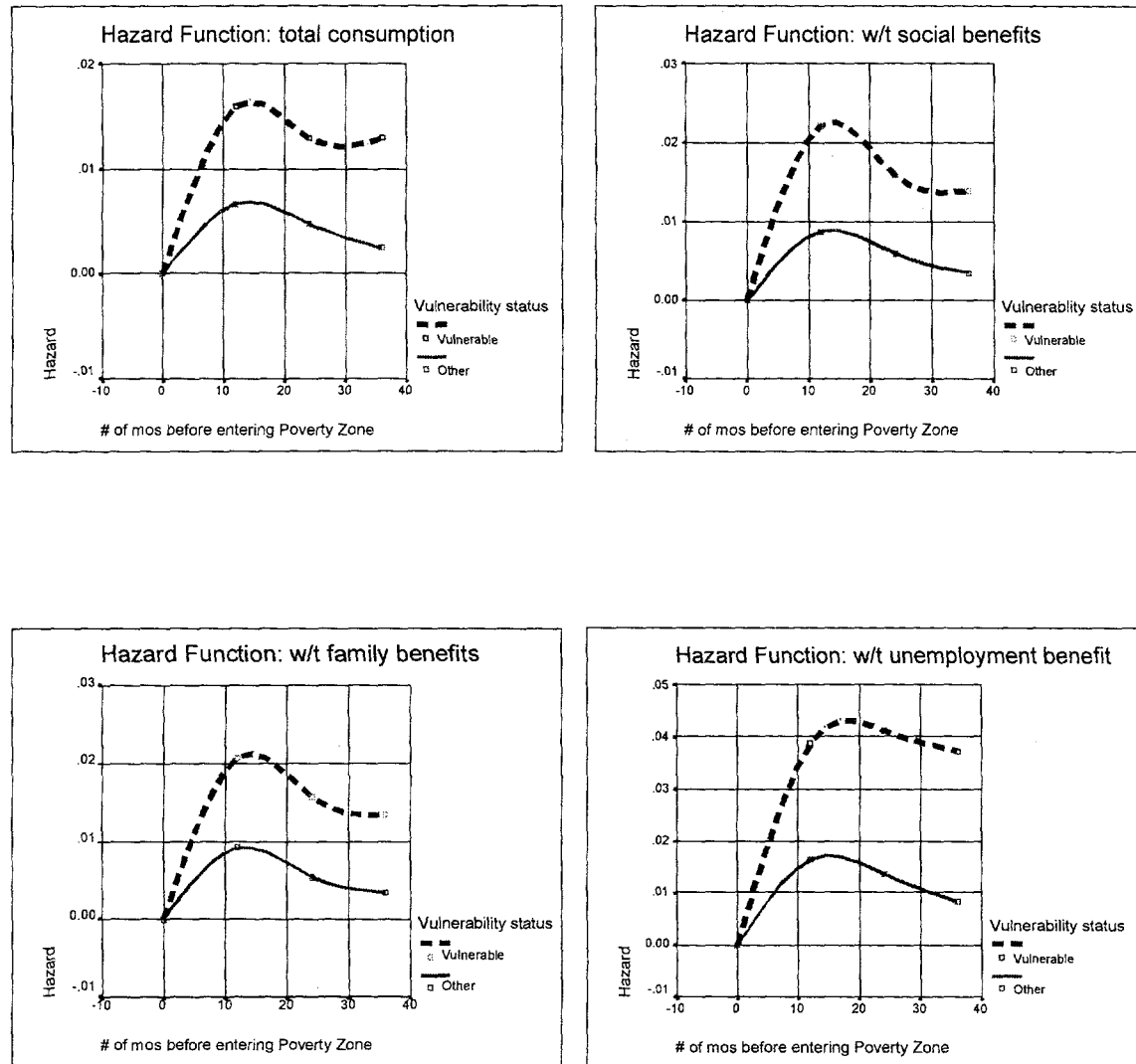
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<sup>50</sup> It is a worthwhile to remember that not all vulnerable households fell into the poverty zone during the four-year study period – 45 percent of them managed to avoid doing so, and they constitute nearly one-quarter (23 percent) of the group that had never been poor.

<sup>51</sup> Since remaining outside the poverty zone is a left-censored phenomenon and no “beginning” of the time-to-event was observed, the median time of being non-poor cannot be precisely calculated and so is not presented here.

Focusing on the role of social benefits in aiding those households that fell into poverty, the risk that they would do so – represented by the hazard rate in Figure 4– varied greatly among the major types of social benefits. This was even more so than in the case of those that survived outside the poverty zone, especially when the households' vulnerability was taken into consideration.

**Figure 4: Avoiding Poverty -- Hazard Rate under Alternative Definitions of Household Consumption by Vulnerability Status**



First of all, the irregular hump-shaped curves are all concave downward, in contrast to the shape of the curves in Figure 3, which described households' chances of rising out of poverty. The conditional probability of falling into poverty rises to a peak before starting to fall. The hazard to poverty grows rapidly during the first year (when the curves reach their vertices) and drops afterwards but at a diminishing rate, becoming a constant hazard after about two years.<sup>52</sup>

<sup>52</sup> Hazard functions with this shape are often found in some models of the process of leaving employment (Lancaster, 1990).

The risk grows at much higher rate among vulnerable households than among non-vulnerable households. One reason for this is that there are two destination states included here -- one is the poverty zone and other is the outside-poverty zone (in which some households remain permanently). Another reason reflects the fact that vulnerable households had a greater propensity to fall into poverty than others, but their risk (conditional probability) of falling into poverty declined after one year, with a tendency to stabilize with each year during which the household successfully managed to avoid falling into poverty.

Not counting social benefit-derived consumption would result in a notable increase in the risk of poverty. As expected, the hazard to poverty was generally lower than was the rate at which households rose out of poverty. However, the impact of benefits was more sensitive to the household's long-term economic outlook as indicated by the consistently greater differences in the risk between the vulnerable and the non-vulnerable (confirming that vulnerable households are much less likely than others never to be poor). This is conspicuously so in the case of the impact of unemployment benefits. Withdrawing these benefits would increase the risk of poverty among the vulnerable households by a factor of about three compared with the baseline case. Among non-vulnerable households, the increase would be by a factor of two, reaching about the same level of risk as vulnerable households in the case of full consumption.

Comparing the effects of social benefits in preventing households from falling into poverty and in promoting them from poverty, they appeared to weight more for the poor, especially the chronically poor, than for the non-poor households (including those who eventually became poor). However, they are somewhat more responsive to the household's long-term economic outlook in terms of preventing poverty -- as they help vulnerable households more than others to avoid falling into poverty -- than in terms of helping to lift households out of poverty (when the difference between vulnerable and non-vulnerable becomes, however, less important and somewhat redundant).

### **PART III: THE DETERMINANTS OF POVERTY AND SOCIAL TRANSFER DYNAMICS**

#### **Introduction**

How social policy interventions affect poverty in the long term depends both on how the benefits are allocated (given the fixed amount of social outlay) and on the household's ability to manage the risk of becoming chronically poor. For instance, the portion of total household consumption derived from flat-rate unemployment benefits may vary substantially among families that are in the same quintile but that differ in size or composition (leaving aside the problem of the sensitivity of the results to which equivalence scale is adopted).<sup>53</sup> On the other hand, even if two households of identical size and composition had the same level of consumption funded by benefits, one of them may end up being chronically poor, while the other may manage to escape falling into poverty. The households that escaped poverty may have done so because of such unmeasured factors as their members' entrepreneurial ability or retraining, factors which are typically associated with educational achievements or the age of the head of household. (Again, this leaves aside the problem of behavioral response as captured in this analysis in terms of the distinction between vulnerable and non-vulnerable households).

This section makes extensive use of the results presented in the preceding sections. The initial specification of the model is applicable here too.<sup>xiv</sup> As regards the substance of the model, two important constraints imposed by the model requirements had to be taken into account when the predictor variables were selected. These constraints were: (i) that, for any two households in different categories (such as the vulnerable/non-vulnerable distinction), the ratio of the estimated hazards over time is a constant and (ii) the covariates are not time-dependent.

#### **A Further Specification of the Model**

The initial goal was to compare how the policy-relevant characteristics of households – the potential risk factors – modified the impact of social benefits on their survival parameters in terms both of avoiding poverty and of rising out of poverty. Therefore, the same set of predictors was run through the model in each context (prevention against falling into and promotion from the poverty zone). Stratifying the sample by household vulnerability status<sup>54 xv</sup> was particularly meaningful here as it is likely that vulnerable households move out of persistent poverty (three-year poverty) at a different intensity (generally lower) than non-vulnerable households because they have some characteristics that make them recipients of benefits. Given the fact that this study only covers the cases of poverty exit that occurred during the period under study (four years), it might be assumed that the proportional hazard model was met (in other words, that the effects of

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<sup>53</sup> The issue of the sensitivity of these results to the selected equivalence scale might be of interest given that the OECD scale was used. Despite being commonly praised for being straightforward and easy to use, this scale is usually considered to assume economies of scale that are too small across the family size distribution (National Research Council, 1995). Alternative approaches are discussed by Lanjouw and Ravallion (1995). Regarding the possibility of including the effect of changes in relative prices between private and public goods, see Lanjouw, Milanovic, and Paternostro (1998).

<sup>54</sup> It was made in all applications, although the LML (log-minus-log) test showed that the baseline hazard function may not have been consistently proportional in both strata (vulnerable and non-vulnerable) in the case of outflow from three-year and longer-term poverty when the benefit-derived consumption was excluded. However, it was proportional under the full consumption measure of household welfare.

the covariates were the same in both groups).<sup>55</sup> Such a reservation is not needed in the case of entry into the poverty zone, as the intensities remained strictly identical in all applications.

A series of working hypotheses can be offered for guiding the search into how the socio-demographic characteristics and social benefits allocation scheme jointly determine poverty survival parameters and, consequently, a household's poverty status over time.

Therefore, those demographic and household endowment variables (including human capital and access to some financial assets) that affect chronic poverty in a significant way (discussed in Okrasa, 1999) were of primary interest in this analysis. These variables were: (i) the household head's age, educational achievement, and marital status; (ii) the composition of the household (type of family); (iii) segmentation variables (such as the socioeconomic group into which the household fits or the sector in which the household head is employed); and (iv) indicators of the household's access to non-income sources of welfare and of the extent to which it benefits from transfers.

A detailed typology of households was used because this is relevant to their chances of experiencing long-term poverty and because policy priorities typically take into account the distinction between families with and without children and between small and large families in terms of the number of children.<sup>56</sup> This information is often supplemented by the marital status of the household's head which, therefore, is included in the control variables in this analysis (with divorced as a left category). For reasons similar to those that applied in the case of the type of family, a set of dummies representing a household's socioeconomic group was included in a set of the predictor variables (with pensioners as an omitted category).

Some of the characteristics mentioned above have also been discussed in the literature as being associated with unemployment. Not surprisingly, the long-term poverty profiles that were discussed earlier in this section resemble, to a large extent, the labor market segmentation described in studies of unemployment in Poland (for instance, Kalaska and Witkowski, 1997) and of duration of unemployment (Cazes and Scarpetta, 1998). In particular, young, poorly educated, unskilled workers, who face the greatest risk of becoming and remaining unemployed for a long period of time have also been identified in this study as having the greatest risk of being chronically poor.

On the other hand, the absence in the model of some of the variables that are typically present in poverty analysis – especially, of those that showed significance for chronic poverty (Okrasa, 1999) – may also need to be explained. For instance, income composition is commonly perceived as a proxy of a household's capacity to respond to economic change because it represents such unmeasured factors as skills and entrepreneurship (see Grootaert, Kanbur, and Oh, 1995). However, it is not included in this analysis because it is considered redundant, given the construction of the dependent variable under alternative definitions of household welfare as the share of income from benefits was used as an adjustment factor for benefit-derived consumption.

Another example of an omitted variable might be the regional rate of poverty, but this cannot be treated as time-invariant during the entire period -- for example, in 1993, it varied from

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<sup>55</sup> This makes it possible both to use the advantages of the proportional hazard model (without further complicating it by introducing the time-dependent variables) and to use less space in presenting the results (without the necessity of replicating them for separately run models).

<sup>56</sup> If analysts are interested in controlling for the fact that different families receive different types of benefits, an interaction term – a product of the type of family and the type of social benefits receipt – can be included as a covariate in the model with full consumption (but this approach was not tried here).

9.6 percent in the Capital region to 18.4 in the South-East region (World Bank, 1995). However, geographical region was included into the set of covariates in a complementary model (as a pattern variable, instead of the type of family). Owning a house was not included for its vague poverty effect, as it is standard for poor families and individuals to own a house in rural areas (and these households are over-represented among the chronically poor). Physical assets were not included directly, on the one hand, because of the endogeneity of selling durables while, on the other hand, their function as collateral for borrowing is captured in an indirect way by the incidence of credit and loans transactions, an indicator variable that is included.

The time-invariant status of such regressors which – in contrast with such characteristics as the head's gender, level of education, or age cohort or the business cycle – may or may not have been changing over time was ensured by checking them either at the beginning and at the end of the period being studied or in each year of the entire period. The first approach was used in the case of variables being introduced all at once, as illustrated by the six-category typology of household composition<sup>xvi</sup> (with households of unrelated individuals as a left category).

Due to the policy importance of this variable (changes in that capture such life events as family dissolution or a newborn baby) the analysis was run on those households that were in the same category both in 1993 and in 1996. As a consequence, about 11 percent of households that changed from one category to another were dropped. The head's marital status (which, in contrast to the quasi-ordered type of family, is strictly categorical) exemplifies using dummies with a '1' for the constant cases. A “female head,” the presence of a disabled person in household, and the head's sector of employment were approximated as constant by comparing their values in 1993 and 1996 (also with a '1' for the constant cases).

The dichotomous indicators of receipt of private or public transfers, as well as of use of credits and loans or possession of a savings account, were coded '1' if they occurred in each of the four years being studied (zero otherwise).<sup>57</sup> Their inclusion in a covariate vector raises a question about endogeneity. However, these variables were included in order to control for such aspects of household behavior as participating in a kinship network or having information about and access to public transfers and to non-income sources (savings or credits and loans). Since no information about the amount of the respective transfers or transactions was used, they did not have to be considered to be endogenous, especially in the context of moving out of poverty because the indicators reflected what the situation was before the household fell into poverty.<sup>58</sup> Also, the frequency distributions of these indicator variables by the number of years in poverty did not differ between the poor and non-poor, except in respect of whether they possessed a savings account.<sup>xvii</sup> However, an alternative version of the model, with these variables omitted, produced very similar estimates of the remaining variables' coefficients.

The only variable that was used in its initial version (as of 1993) was the socioeconomic group variable, despite the fact that there was some inter-group transition during the period (the group consisting of those living on welfare was the least stable, followed by the self-employed). However, this variable represents the “policy-relevant biography” of a household at the time that it fell into poverty, and, therefore, it had to be included in a set of fixed-time regressors.

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<sup>57</sup> In the case of inter-household transfers, households reported either giving or receiving them. In the case of possessing a savings account or using credits and loans, households reported participating in the following transactions -- either saving or dissaving or taking on credits and loans or paying them back.

<sup>58</sup> Following Lancaster's (1990) condition that any time-invariant regressor is necessarily exogenous, all fixed-time factors (on the basis of their equality during the studied period) that are included in the model – such as marital status or type of family, or receipt of and access to transfers or non-income sources – can be considered exogenous rather than endogenous.



Finally, dummies for each year during which it was possible to observe the beginning of a poverty spell (in other words, for the years 1994, 1995, and 1996, with 1994 omitted) were included. They were meant to represent the effects of overall economic conditions (the 'business cycle') on the probability of the household moving out of poverty (or falling into it), as well as the aggregate effect of changes in government policy on social transfers.

## **Empirical Results**

The empirical results are presented in two steps. First, the overall changes in the survival parameters are briefly discussed, emphasizing the type of family variable. Second, the risk factors for poverty status over time are discussed for both inflows into and outflows from poverty under alternative definitions of consumption. In addition, the effects of family allowances and unemployment compensation on the risks associated with transition in and out of poverty (expressed as the differences between the cumulative hazard function for the case of "with" and "without" benefits) are presented in graphical form for selected groups of households. In some cases, the survival function is also included. The detailed results of the regression model that was used are in Table C-1 and Table C-2 in Appendix C. In order to facilitate the discussion, excerpts of these tables are presented below in Table 1.

The model was highly significant in each of its eight applications when the dependent variable was calculated: (i) for the case of full-consumption in the context both of avoiding and moving out of poverty; (ii) when consumption derived from all benefits (other than pensions) was excluded in the context both of avoiding and moving out of poverty; (iii) when consumption derived from family allowances was excluded in the context both of avoiding and moving out of poverty; (iv) when consumption derived from unemployment benefits was excluded in the context both of avoiding and moving out of poverty.

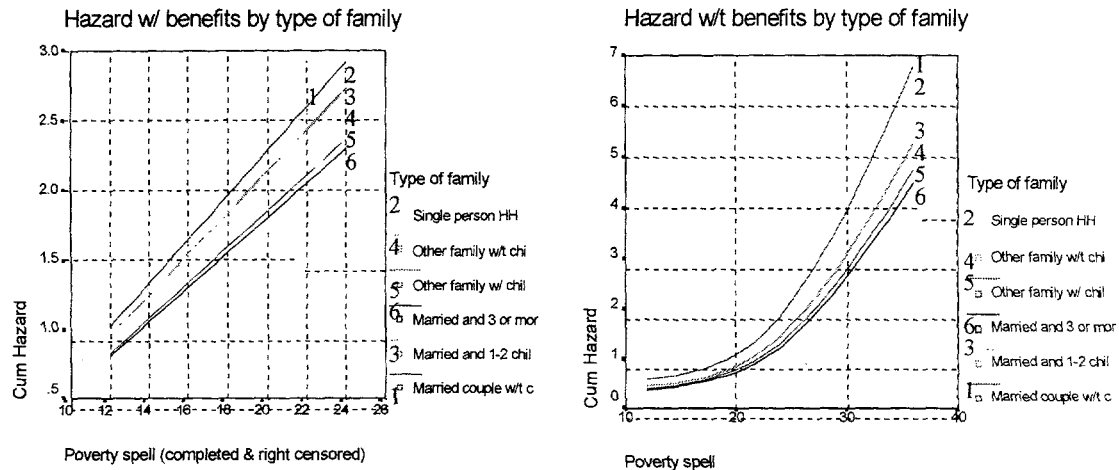
This made it possible to draw conclusions about the effects of social benefits and about risk factors for falling into and moving out of poverty by comparing the survival parameters estimated for these different (simulation) situations. At first glance, the overall effect of the social benefits was sizable in both contexts of the assessment (confirming the results presented in the previous section). As regards promotion from poverty reflected in a decline in the cumulative hazard functions, the prospect of a household moving out poverty after two years would be smaller by a factor of about two (dropping from 2.6 to 1.4) when benefits were not counted compared to when they were. The risk of falling into poverty would also be substantially larger without social benefits – on average, by about one-third among the non-poor during two subsequent years (from 0.12 to 0.17).

The household vulnerability status greatly modified the effect of benefits on the survival parameters. The rate of moving out of poverty was significantly diminished, while the risk of falling into the poverty zone also rose considerably. Being vulnerable meant that the exit rate (for example, for those in two-year poverty) was reduced to about 1.5 compared with 3.7 among non-vulnerable households. So, the odds of being vulnerable were even slightly higher than the odds in the case when benefits were not counted. In the case of falling into poverty, the disparity in the risks was also substantial, ranging from about 0.10 among the non-vulnerable to 0.20 among the vulnerable households.

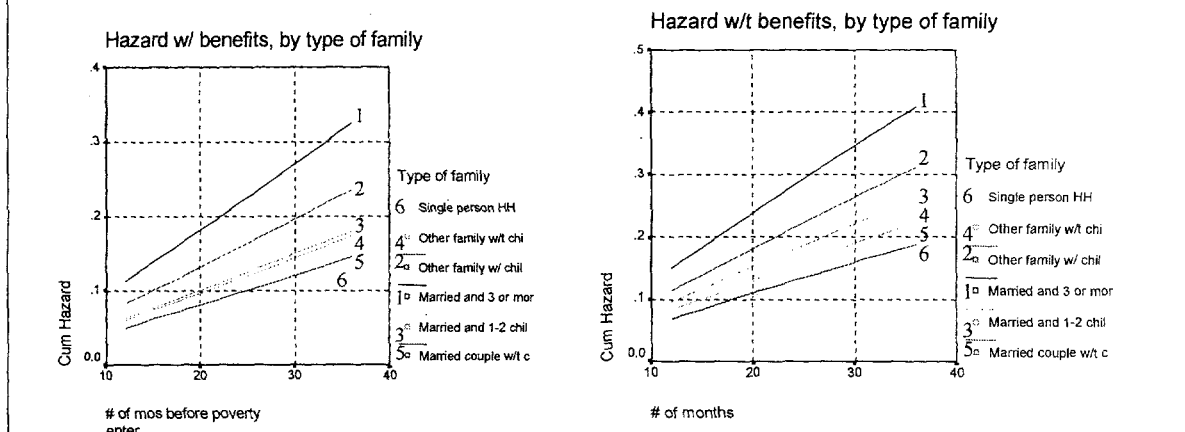
*Effects of Benefits on Poverty Transition for Different Types of Families.* Since the distinction among different types of family is a key policy variable, this was used as "pattern"

variable in the model. The estimates of the survival parameters differed substantially in each of the major dimensions of comparison.<sup>59</sup> Figure 5 below illustrates changes in the cumulative

**Figure 5: Hazard Function for Rising Out of Poverty with and without Counting Social Benefits by Type of Family**



**Figure 6: Hazard Function for Falling into Poverty with and without Counting Social Benefits by Type of Family**



hazard function for transition in and out of poverty due to excluding all social benefits among households with different compositions (including single-person households).

More detailed results, in a form of series of figures which include households' vulnerability status without counting family allowances and unemployment benefits in the context of transitions into and out of poverty, are available from the author. This variation between different types of households was greatly heightened when their vulnerability status was taken into account. It accords with the observation made earlier that the overall effect of social benefits differed substantially between vulnerable and other households (being generally higher

<sup>59</sup> There are 16 major dimensions of comparisons {two contexts of the assessment (inflow into and outflow from poverty)} x {four definitions of consumption and poverty pattern over time ("with" and "without" all benefits with specifications for family allowances and unemployment benefits)} x {two strata by the vulnerability status of household}.

among vulnerable households). And also with the fact that the two variables – vulnerability and household composition – modified each other's impact on household poverty status over time.

Among vulnerable households, the rate of moving out of poverty would decline dramatically and become practically indistinguishable among the different family types if the benefits were not counted (at least not until they had spent about two years in poverty). This held in each of the three “without-benefits” situations, that is, when either all benefits or family allowances or unemployment benefits were not counted. So, for the poor, being vulnerable is even more important for reducing their probability of moving out of poverty than belonging to a large nuclear family. This means that it may be more useful to policy practitioners to know about a household's vulnerability status than about its composition.

However, that was not the case in the context of inflows into poverty (Figure 6). On the contrary, the risk spread even more widely with each subsequent year that households with different family compositions stayed out of poverty in the case of the vulnerable compared to non-vulnerable households.<sup>60</sup> A firm pattern emerged from the comparison of the hazard functions between the households of different family compositions, and the pattern remains consistent in the different simulation situations (in other words, under alternative definitions of consumption -- details available from the author). As expected, the order of the different types of family was reversed in both contexts.

Among poor households, either vulnerable or not, the lowest exit rate from poverty was for families with three or more children, followed by “other” families with children (including single-parent families and grandparents with children). At the other extreme, the group of households that was best placed for rising out of chronic poverty was married couples without children and single-person households. Small nuclear families (with one or two children) and families without children fell in between these two extremes.

In the case of inflow into poverty, the order was exactly reversed, with families with three or more children and single-parent families facing the greatest risk of being poor while single-person households and childless married couples were the least endangered. Small nuclear families and families without children again fell in between these two extremes.

To assess the impact of social benefits, the differences between the cumulative hazard functions calculated under alternative definitions of consumption can be compared for the different types of families. Generally, the chances of exiting poverty for vulnerable households were reduced by much more than those for non-vulnerable households when benefit-derived consumption was not counted, being somewhat bigger when unemployment benefits were not counted than when family allowances were not counted. Non-vulnerable households would experience the same reduction in their chances of rising out of poverty in both cases (that is, when either family allowances or unemployment benefits were not counted).

For instance, withdrawing family allowances from poor 20th month single parents and non-parent families with children (that is, other than nuclear families with children) would diminish their exit rate from poverty from about 1.2 to about 0.6 among vulnerable households and from 3.0 to 2.0 among non-vulnerable households (the appropriate graphs are available from

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<sup>60</sup> Incidentally, the pattern for the risk of falling into poverty among non-vulnerable households when the benefits were not counted was, in each of the three simulated situations, very similar to that shown by vulnerable households in the actual situation (with all benefits included). Thus, it can be concluded that withdrawing social benefits from the budget of non-vulnerable households would reduce their ability to cope with the risk of poverty to the level of vulnerable households receiving benefits. (After surviving for at least two years outside the poverty zone, the risk of poverty that would be faced by non-vulnerable households without benefits would still not exceed of the risk faced by vulnerable recipient families).

the author). Among non-vulnerable households, the drop in the exit rate when unemployment benefits were not counted was practically the same as when family allowances were not counted. However, this difference was somewhat bigger among vulnerable households.

The changes in the risk of falling into poverty (which can be approximated in a similar way as above – details are available from the author) were also bigger when unemployment allowances were not counted than when family allowances were not counted, but only among the vulnerable. Among the non-vulnerable, there was no difference between the effect of these two benefits.

For instance, in the case of a non-vulnerable, married couple with three or more children who stay out of poverty for 20 months, their hazard to poverty would increase from 0.16 under full consumption to 0.20 if family allowances were not counted and to 0.20 if unemployment benefits were not counted. If this family were vulnerable, the risk would rise from 0.23 with all benefits counted to 0.27 and to 0.30 if family allowances and unemployment benefits respectively were not counted.

These comparisons (which can be extended to all of the categories of household composition) illustrate one way to assess the effectiveness of a particular kind of social transfer either in helping the poor to escape from poverty or in enhancing other households' abilities to avoid poverty.<sup>61</sup> Two other ways – comparing the relative risks and comparing cumulative hazards – are discussed below.

*Risk Factors and the Effects of Social Benefits on Long-term Poverty.* Table 1 below presents the exponential values of the hazard function's coefficients of the predictor variables ( $e^{\beta Z}$ , calculated at the mean of covariates). These results confirm, first of all, the asymmetrical nature of transitions in and out of poverty. Among the most prominent examples of the asymmetrical risk factors – which contribute differently to the exit rate from poverty than to the risk of falling into poverty – are: the educational achievement of the household head (other than university diploma holders), the type of family (other than single-person households and married couples without children), the household's socioeconomic group (other than employees and pensioners), the household head's sector of employment (especially when all benefits were not counted), the household's receipt of either private or public transfers, and its possession of a savings account.

On the other hand, in addition to the characteristics mentioned above in parenthesis (some of them are simply reference categories), certain factors act in fairly symmetrical way, contributing to a similar extent to the hazards in both directions. These include: the age, gender, and marital status of the household head (except when all benefits were excluded), having access to credits and loans (except when family allowances were not counted); and the presence of disabled person in household.<sup>62</sup>

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<sup>61</sup> This way is possible only if a predictor has been used as a pattern variable, for which the program calculates cumulative hazard functions.

<sup>62</sup> Generally, if a coefficient is lower than unity in the column "enter," the variable (or category) is a real risk factor for entering poverty (compared to a reference group). When it is in the column "exit," it indicates a greater chance of rising out of poverty (compared to a reference category).

Table 1: The Hazard Function's Coefficients of Risk Factors for Falling into and Moving Out of Poverty under Alternative Definitions of Consumption (exponential values)

Variables (Covariates)	Total Consumption		If not counted consumption derived from:					
	Poverty		All social benefits Poverty		Family Allowances Poverty		Unemployment benefits Poverty	
	Exit	Entry	Exit	Entry	Exit	Entry	Exit	Entry
<b>Head of Household</b>								
Age	.999	.993	.998	.995	1.000	.993	1.000	.992
<b>Education Achievement</b>								
Elementary or below	.683	3.287	.660	3.674	.634	3.471	.694	3.327
Vocational or high School incomplete	.689	2.814	.671	3.048	.652	2.936	.719	2.720
High school or University incomplete	.678	2.058	.693	2.099	.643	2.068	.715	1.854
University (omitted)								
Female head	1.041	1.015	1.142	.882	1.015	.967	1.126	.943
<b>Marital Status</b>								
Never married	1.252	1.111	.952	1.144	1.109	1.047	1.100	1.212
Married	1.027	1.060	.955	1.128	1.001	1.100	1.024	1.090
Widowed	.870	.869	.670	1.074	.785	.905	.832	.877
Divorced (omitted)								
<b>Family Type</b>								
Married without children	1.008	1.019	1.105	1.062	1.031	1.179	1.023	1.033
Married and 1-2 children	.947	1.276	.820	1.544	.816	1.618	.877	1.341
Married and 3 or more Children	.786	2.348	.686	2.470	.617	2.654	.772	2.258
Other with children	.834	1.658	.784	1.819	.781	1.897	.743	1.730
Other without children	.958	1.208	.882	1.271	.983	1.264	.814	1.329
Single person HH (omitted)								
Disable person i HH	.984	1.047	1.007	1.071	.991	1.058	.955	1.083
<b>Head's employment sector</b>								
Public sector	.892	1.138	.797	1.321	.954	1.320	.726	1.362
Private sector	.914	.994	.873	1.163	1.005	1.136	.823	1.130
<b>Socioeconomic group</b>								
Employees	.872	.953	1.256	.754	.924	.948	1.053	.768
Farmers and a mixed group	.889	1.013	.956	.849	.855	.931	.917	.937
Self-employed	.877	1.190	1.083	.905	.852	1.250	.988	.848
Welfare recipients	.848	1.660	.744	1.213	.766	1.120	.678	2.436
Pensioners (omitted)								
<b>Financial assets and transfers (incidence)</b>								
Savings account	1.001	1.317	1.076	1.244	1.008	1.343	.974	1.220
Using credit and loan	.796	.796	.931	.955	1.113	.806	.822	.829
Private transfer	.949	1.561	1.211	1.432	.963	1.605	1.090	1.430
Public transfer	.905	1.121	.865	1.089	.818	1.165	.923	1.067
<b>Poverty spell began</b>								
In 1995	.552	.128	.498	.169	.522	.145	.536	.158
In 1996	.321	.221	.328	.256	.339	.232	.359	.249
In 1994 (omitted)								

This illustrates what kind of recommendations can be made regarding policies that would take into account temporal differences in need (as represented here by the risk factors). Policies aimed at lifting households out of poverty would be more effective if they focused on those households characterized by asymmetrical factors whose chances of moving out of poverty were lower than others, especially if, at the same time, their risk of falling into poverty were higher than others. This point is expanded below in the course of developing a typology of factors in terms of their contribution to poverty mobility.

However, while comparing the coefficients of the hazard functions in Table 1 that refer to both inflows into and outflows from poverty, it should be kept in mind that the households involved in each case constitute two different groups that only overlap to some extent with each other and are far from being identical.<sup>63</sup> Therefore, the coefficients are not fully comparable between the two contexts, and they are more often statistically significant in the case of falling into poverty than of moving out of it.

To continue the discussion about the influence of *household composition* and *the head's marital status*, the relative risks associated with each category – for either exiting poverty or falling into it – were fully compatible with the patterns discussed earlier. Families with three or more children had the lowest likelihood of moving out of poverty, and their chances of doing so would drop to 0.6 if family allowances were not counted from 0.8 under full consumption, compared with households of unrelated individuals (a reference category). They were followed closely by other families with children, within which there was a prevalence of single-parent families.<sup>64</sup> Families with three or more children also had the highest relative risk of falling into poverty, ranging from 2.3 to 2.7 times higher if unemployment benefits and family allowances respectively were not counted. The analogous risk was also very high for single-parent families (1.7 and 1.9 respectively), followed by nuclear families with up to two children (1.3 and 1.6 respectively). Households consisting of married couples without children and households of unrelated individuals were the least endangered by poverty or, once in poverty, had the highest exit rate from it. The rate for households consisting of married couples without children was slightly better than the rate for households of unrelated individuals, especially when all benefits were excluded.

Poor single-person households were fairly diverse in terms of the survival parameters. Two categories of marital status predominated among this group of householders – those who had never married (about one-fifth) and those who were widowed (about two-thirds), and these two groups represented the opposite ends of the spectrum of relative risks. Those who had never married had the highest probability of escaping from poverty, while those who were widowed had the lowest probability. Those in the married category fell in between and were almost the same as those in the divorced category, which was a reference group. This order remained unchanged whether social benefits were counted or not.

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<sup>63</sup> The group of the poor consisted of households who began their poverty spell during the period under study, being much smaller (about 18 percent of the sample) and less heterogeneous than those included in the analysis of the risk of falling into poverty. The latter group includes those who were originally non-poor and who either eventually became poor or survived outside the poverty zone throughout the whole period (71 percent of the sample).

<sup>64</sup> The fact that the group of other families with children (including single-parent families) was in a somewhat better situation compared to large families with children may reflect the fact that single-parent, low-income families benefit from the reduced personal income tax (since 1993). The issue of how tax and social benefits affect the long-term economic outlook of the household may be of further analytical interest but is not explored here.

In contrast to the type of household, no symmetrical pattern (of the hazard function's coefficients) was shown by the head's marital status in the case of households' transitions into and out of poverty respectively. The households of widowed people (who are the most disadvantaged group among the poor) had the smallest risk of falling into poverty. On the other hand, the households of people who had never been married had the highest risk of being impoverished, and this risk became particularly high when unemployment benefits were not counted. This accords with the point made earlier that the relative odds of being vulnerable are greater (by about two times) among single-person households compared to others. These two groups of households – headed by widowed people and those headed by people who had never married – presented diametrically different patterns of poverty mobility. The highest poverty turnover was found among those households with a head who had never married and the lowest risk was found among those households with widowed heads.

Again, this illustrates another type of policy recommendation that can be made based on this kind of analysis -- namely, that policy interventions aimed at helping households to move out of poverty would be more effective if they focused on (if the benefits were targeted to) households headed by widowed people rather than on those headed by people who had never married. However, for policies aimed at helping households to avoid falling into poverty, the focus should be on households with heads who had never married. The data showed that these recommendations would be especially relevant in situations where the heads who had never married were younger and the widowed heads were older than average in the sample (as is likely to be the case in reality).

The presence of a *disabled person* in a household does not affect the household's hazard, except that it slightly lowers the chances of poor households moving out of poverty and slightly increases their risk of falling into the poverty zone. There would be a small increase in the rate of moving into and out of poverty if no social benefits were counted. This suggests that households that include a disabled person have greater poverty mobility than others when benefits are reduced (other than pensions, including disability pension).

The *age* of the household head did not significantly affect household survival parameters in the context of poverty exit, regardless of whether or not the benefits were included in the household welfare measure. One of the reasons was revealed when the age cohorts were used in the place of the age variable. They showed a U-shaped pattern, with heads aged 51-65 having the lowest chances of exiting the poverty zone. This may reflect the fact that the poor in the pre-retirement age cohort are, generally, less likely to take advantage of such opportunities as retraining or getting a new job or relocating to find a better-paying job. This pattern became more linear in the case of falling into poverty – the excess risk of falling into the poverty zone declined with each additional year of the head's age. However, this was significant only in the case of unemployment benefits, indicating that younger households (who were over-represented among the unemployed) depend to a larger extent on this type of benefit and would be in bigger danger of becoming poor if they no longer received them.

The *gender* of the head is almost neutral for household survival parameters under the full consumption definition of household welfare. However, if social benefits were not counted, female-headed households would consistently be better off than male-headed households. Female-headed households had a lower hazard to poverty and, once in poverty, they also exited it faster than male-headed households. The major reason for this seems to be, all other things being equal, the stronger effect of unemployment on the welfare of households headed by men versus those headed by women, as reflected here by unemployment benefits (which had a bigger effect than family allowances). This is suggested by the fact that male-headed households had a smaller chance (by about 13 percent) of moving out of poverty when employment benefits were not counted than female-headed households. Thus, the risk of falling into poverty would also be

somewhat higher for male- than female-headed household, especially, if all benefits were not counted.

*Education* is the strongest predictor of a household's poverty survival parameters among all human capital variables. This is consistent with evidence that there is a strong association between education and the duration of unemployment in Poland (Cazes and Scarpetta, 1998). Workers with a higher education have the best chance of getting a job while those with a primary education or less have the least likelihood of becoming employed and, while being unemployed, they have the highest chance of becoming unemployed.

The relative risk of falling into poverty was up to 3.5 times higher among households with heads with only an elementary school diploma or less compared to the reference group of university diploma holders. Among the poor, the poverty exit rates were consistent with this. For every 10 households headed by university diploma holders that left the poverty zone, there were only six to seven households with heads with any other level of education who did the same. However, the statistical significance of the particular level of the head's education was confined to inflows into poverty as the exit rate from poverty was basically flat among all households other than those households headed by university diploma holders.

*Access to credits* and *accumulated assets* presented a rather complex pattern. Households that had taken advantage of credits or loans demonstrated a pattern of poverty status over time that was directly opposite to the pattern of those households that could draw on their savings (in both cases, on a permanent basis, in each year). At first glance, it seemed that households possessing savings accounts had both a larger and a quicker turnover into and out of poverty than the households that borrowed money.

It became clear that poor households were borrowing money from basically private sources as only one out of every seven households among those that were permanent users of credits or loans borrowed from a formal financial institution. As previously suggested, the poor, who typically have no assets, are forced to act in this way (as their last hope of escaping from poverty) due to their liquidity constraints rather than being motivated by a desire to optimize their long-run economic prospects. However, in general, this does not help them as the data showed that money borrowers had a lower exit rate from poverty than poor households that were not borrowing money from others. (This accords with the negative association between using credits and the number of years in poverty, which was discussed earlier.) Only when family allowances were not counted were the borrowers somewhat relatively better-off, which indicates that these benefits were a more significant source of income to those poor households that were not getting private loans than to those who were. By contrast, among the non-poor, borrowing money seems to act as an effective safety net preventing them from falling into poverty. The risk to borrowers of falling into poverty was smaller by about one-quarter than the risk to those households that had not borrowed money.

Possessing a savings account did not much help poor households to move out of poverty, and their exit rate would only be slightly higher if benefits were not counted.<sup>65</sup> On the contrary, non-poor households that engaged in such transactions (and that could draw on their savings) had a generally higher risk of falling into poverty (up to about one-third) than those who did not report possessing a savings account. Despite being barely significant, this observation seems to contradict the finding that households that did not possess a savings account were more likely to be poor (by about a half) than to be non-poor. The most likely explanation for this is the fact that, among those who had some accumulated assets, dissaving was commonly used (albeit not always

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<sup>65</sup> For instance, Glewwe and Hall (1995) also did not find any evidence that savings had an impact on vulnerability.



successfully) when the household's risk of falling into poverty increased due to such events as a household member losing a job or another reduction in the household's income. In this sense, savings would act in a way similar to transfers, both public and private, as discussed below.

Another explanation may be the fact that the dummy used here referred to the occurrence of transactions but not to the amounts involved in those transactions or to the size of the accumulated assets. On the other hand, the paradox of contra-cyclical savings (as discussed by Deaton, 1991, who argued that savings rise when income is falling and that savings fall when income is rising) is not implausible here. This point is discussed below in connection with the cumulative hazard.

*The receipt of transfers*, private as well as public, was associated with a consistently higher risk for falling into poverty than that faced by non-recipients throughout the whole study period. Those who received private transfers had about a 40 to 60 percent higher risk of falling into poverty when unemployment benefits or family allowances respectively were not counted. This accords with the predictions of Cox and others (1997) that inter-household transfers may fill a significant portion of the income gap left by unemployment or by reduced public transfers. The pattern was somewhat mixed in the case of the poor. Their receipt of transfers did not significantly modify their chances of exiting poverty. The reason for this may be that a principle of exchange rather than charity seems to motivate poor households to participate in inter-household transfers (as such a motive seems to be more likely among "equals") and that all low-income households experienced a downturn in their economic welfare at about the same time. Some increase in their chances for exit (by about one-fifth) was seen when no social benefits were counted; a similar tendency was also shown when unemployment benefits were not counted.

Permanent participation in public transfers (during four years), which is common among the chronically poor and was previously shown to be an indicator of high welfare dependency, was again associated here with a low exit rate from poverty. The chances of escaping from poverty were reduced by much more when family allowances were not counted (by about one-fifth) than when unemployment benefits were not counted. This reflects the fact that the fraction of households receiving the family allowances during the four-year period was much larger than the fraction of permanent recipients of unemployment benefits.

When the effects of receiving private and public transfers were compared, it became clear that the transfers complemented each other rather than substituting for each other because they had different effects on the transition in and out of poverty. Inter-household transfers were more important for preventing a recipient household from falling into poverty than for helping them to exit poverty, whereas recipients of social benefits were more strongly affected in terms of their chances of exiting poverty than of avoiding poverty.<sup>66</sup>

*Socioeconomic groups* presented a more diverse pattern of the effect of social benefits on the household survival parameters than did the other covariates. Among the poor, the exit rates were relatively flat and low among all groups compared to pensioners (a left category) under the full consumption definition of welfare. However, in each of the three simulation situations (without counting all benefits, without counting family allowances, and without counting unemployment compensation), the results varied. Only the group of households for whom social welfare was their main source of maintenance was consistently at the bottom of the list in terms

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<sup>66</sup> This is not surprising in light of the fact that a large portion of private transfers were given and received between households with similar levels of welfare. Also, earlier studies (Cox et al, 1997) found that there was a significant decrease in transfer amounts during the transition, as most households experienced downturns about the same time.

of their chances of escaping poverty.<sup>67</sup> Households living on wages or on non-farm self-employment income had more chance of moving out of poverty than others (including farmers and pensioners) when no benefits were counted.

The pattern in the case of inflow into poverty was somewhat different. The relative risks of impoverishment were fairly differentiated among the various socioeconomic groups under the full consumption scenario but became less differentiated when benefits were not counted, being generally lower than among pensioners. When benefits were not counted, the pensioner households are not any better off than other households except for the welfare recipients who consistently had the highest risk of falling into poverty.

When the patterns of risk for the various groups of falling into poverty or, in the case of poor households, of rising out of poverty were compared, this suggested that pensioners were the only group that could potentially (when social benefits were not counted) be characterized by high poverty mobility. However, there was a big difference in terms of turnover among poor households -- it was much higher among the households of employees and the self-employed than among poor households of farmers or welfare recipients. (It is worth noting that there seemed to be a bigger difference in this respect between the rich and poor farmer households, who generally had relatively low rates of both poverty entry and exit, compared with other groups of households.)

*The sector of employment* of the head of household was defined as either the public or the private sectors of the economy throughout the entire period under study (with pensioners and others as a left category). It shows that households headed by private-sector employees were in a somewhat more favorable situation than those headed by the public-sector employees. Poor households consisting of private-sector employees had a slightly higher chance of escaping poverty, but this advantage was statistically significant only in the case of unemployment benefits. Their relative risk of falling into the poverty zone was also lower, both when unemployment benefits and when family allowances were not counted.

The bigger discrepancy between the exit rates into and out of the poverty zone among households headed by the public-sector employees indicates that there was generally less poverty mobility in this group than among households with private-sector heads. The risk of falling into poverty increased and the chance of escaping poverty decreased significantly among both groups of households when social benefits, particularly, unemployment benefits, were not counted. The households living on labor income were, therefore, generally more sensitive in terms of their survival parameters to changes in social transfers, especially in regard to the benefits associated with the head's employment status, than were all other households. Their relative risk of either falling into poverty or of staying in long-term poverty increased substantially if such benefits were lowered. This accords with the patterns of hazard among different socioeconomic groups.

The relative advantage enjoyed by households headed by private-sector workers may be due to both objective and subjective elements. First, jobs in the private sector generally yield higher returns than those in the public sector do (Rutkowski, J., 1996). However, this premium of private over public sector pay began to decline in the mid-1990s when the overall performance of many of state-owned companies began to improve (Newell and Socha, 1998). Also, both the highest paid group of jobs and the lowest paid group of jobs were in the private sector (Rutkowski, 1998), which means that the private sector had bigger wage disparities than the

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<sup>67</sup> This group was, however, relatively the most volatile as only about 40 percent of households lived on welfare benefits as the main source of maintenance during the whole period under study.

public sector.<sup>68</sup> The second reason for the relative advantage enjoyed by households headed by private-sector workers may be because these heads had better job-seeking skills due to having had experience in the private sector. People with such experience are reported to have a smoother transition from unemployment to employment (Cazes and Scarpetta, 1998).

The *year* in which a household fell into poverty yields two types of information. It is relevant not only in terms of how healthy the overall economy was at the time and of what stage of development the country's social protection systems were at the time, but it also indicates a tendency in the relative risks among the time-events -- either falling into or exiting poverty.

For those in poverty, the later a household entered the poverty zone, the harder it was to leave it. So, those who began their poverty spell in 1995 found it twice as hard to move out of poverty as those impoverished in 1994 (a reference year), and it was three times harder for those who began poverty in 1996, the last year being studied. For those who avoided poverty until 1995, the relative risk of falling into poverty was about eight times lower than those who fell into poverty in 1994, but the risk was twice as large for those who survived outside poverty until the subsequent year, 1996.

### Using these Results

The remaining part of this paper, which is devoted to a further discussion of the results summarized in Table 1, is explicitly written from the point of view of a social policymaker. This is in order to illustrate the way in which these results can be used to solve some of the most difficult, yet largely neglected, policy problems (signaled in the Introduction) that are involved in the question of how to improve the overall performance of the safety nets in the face of the long-run poverty.

After reviewing how household-level risk factors affected transitions into and out of poverty, it was then possible to look at the differences between the hazards associated with each of the analyzed categories (risk factors) and to analyze them in the context of four possible social policy interventions: making no change in the social protection system - reducing family allowances - reducing unemployment benefits - reducing all social benefits (other than pensions).

As was occasionally illustrated above, such comparisons can be interpreted straightforwardly in terms of poverty mobility, in other words, how a particular characteristic of a household combined with a change in the social benefit system determines the household's poverty status over time. From a policy evaluation standpoint, the results of this exercise can be used to demonstrate (in a measurable way) how a particular change in the social protection system will affect the poverty survival capacities of a given, policy-relevant category of households (compared to the poverty survival parameters of those in a complementary category).

Both poverty mobility and the effectiveness of the safety nets in dealing with long-term poverty were used as criteria for evaluating the social protection system in this analysis of the dynamics of poverty and social transfer receipt. This approach seemed to be the most likely to yield the necessary suggestions for designing social policies that take into account the long-run economic outlook of the poor households. The two ways of using these results are discussed below.

*Poverty Mobility.* A summary of how the variables that represent a household's risk-coping capacity (including human and non-human asset endowments) affect its poverty status over time under different policy interventions is presented in Diagram 2 below. The typology of

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<sup>68</sup> Among the heads of households in the panel, the median wage in the private sector was lower than in the public sector during the period being studied.

Diagram 2: The Effect on Poverty Mobility of Household-level Risk Factors: Comparing the Hazards (Relative Risks) of Falling into and Moving Out of Poverty

POVERTY EXIT			
		High	Low
ENTRY	High	<p>A. (High poverty mobility and possibly high turnover among the poor)</p> <ul style="list-style-type: none"> <li>• Head never married</li> <li>• Head married</li> <li>• Family of married couple without children</li> <li>• HH possesses savings account</li> <li>• HH participates in private transfer network</li> <li>• Central region</li> </ul>	<p>B.</p> <ul style="list-style-type: none"> <li>• Head with lower than university diploma</li> <li>• Family of married couple with 3 or more children</li> <li>• Single-parent and other family with children</li> <li>• Disabled person in HH</li> <li>• Head employed in public sector</li> <li>• HH participates in public transfer</li> <li>• HH of welfare recipients</li> <li>• HH of pensioners*</li> <li>• South West region*</li> <li>• Central East region</li> <li>• Central West region</li> <li>• North East region</li> </ul>
		<p>C.</p> <ul style="list-style-type: none"> <li>• Head holds university diploma*</li> <li>• Head female</li> <li>• HH of single-person*</li> <li>• HH of employees</li> <li>• HH of self-employed</li> <li>• Capital region</li> <li>• South region</li> <li>• North region</li> </ul>	<p>D. (Low poverty mobility and possibly low turnover among the poor)</p> <ul style="list-style-type: none"> <li>• Head widowed</li> <li>• Head divorced*</li> <li>• HH using credits or loans (private)</li> <li>• HH of farmers (including 'mixed' group)</li> <li>• South East</li> </ul>

Notes: This typology is based on the patterns of hazards emerging in the simulations (without benefits).

\* The reference categories are (in the case of multi-categorical variables): head divorced; head holding university diploma; single-person household; households of pensioners; South West region.

*Poverty mobility* (predicted) is *high* among households with prevalence of the characteristics associated with high relative risks for poverty entry. If it is accompanied by high probability of exiting poverty there might be expected also high *turnover* among the poor households with such characteristics; otherwise it may lead to persistent poverty.

*Poverty persistence* is *high* among households with a prevalence of the characteristics associated with low exit rate from poverty. If its is accompanied by low hazard to poverty there might be expected also low turnover among the poor households with these characteristics.

the household-level risk factors for poverty mobility and poverty persistence is based on the coefficients of the hazard function associated with each category of the analyzed variables (as discussed above). Since it was done both for inflows into and outflows from the poverty zone, the categories can be interpreted in terms of the contribution that each of them has made to a household's poverty mobility or to poverty persistence as follows:<sup>69</sup>

- A characteristic contributes to poverty mobility if it is associated with a higher relative risk of both falling into and moving out of poverty, while conversely mobility is low if the relative risk is lower in both situations. Examples of characteristics associated with high mobility are the variable categories mentioned in quarter A of Diagram 2 (for example, if the head of the household has never married or is employed in the private sector or if the household receives inter-household transfers).
- A characteristic contributes to poverty persistence if it is associated with a lower relative chance of moving out of poverty. It also contributes to a low overall turnover among the poor. Examples include the variable categories mentioned in quarter D of Diagram 2 (if the head of the household is widowed or if the household is a farming household; however, given a high overall poverty rate in the latter group, one may expect that the turnover among the poor households in this group may also be high).

The typology illustrated in Diagram 2 takes into account patterns of influence under different simulated conditions and, as such, it gives only an approximation of a real situation.<sup>70</sup> The ability to identify those who would be relatively better off or worse off (vis-à-vis a reference category) if a given change in the social benefits were made provides an invaluable tool for policy practitioners concerned about long-run poverty. However, they may also be interested in the effect on chronic poverty of a change in absolute terms in the overall risk of falling into poverty, or chance of moving out of poverty. This is discussed below.

*Social Benefits and Poverty Survival Parameters for Different Groups.* The cumulative hazard function and the survival function – calculated under the alternative definitions of consumption (with and without benefit-derived consumption) – constitute new variables that can be used to assess the effects of changes in the social benefit system on the households poverty status over time.<sup>71</sup> This can be done in a straightforward way by comparing the means of these two variables for various groups that are of policy interest. For instance, the chance of rising out of poverty for poor households of employees would drop by 28 percent if no social benefits were counted. It would drop by 17 percent and by 12 percent if unemployment benefits and family allowances were not counted respectively, as it can be seen from Figure 7a.

The analogous figures for the case of unemployment benefits, according to the same graph were: 11 percent for farmers; 15 percent for pensioners, and 25 percent for the self-

<sup>69</sup> In both cases, the term “contributes” has one of two possible meanings, depending on the substantive interpretation of the covariate: (i) it may imply a causal link (for instance, “holding a university degree reduces the risk of falling into poverty”) or (ii) it may only indicate that the event coincided with the poverty exit or entrance as a correlate of either of the two (for instance, “participation in private transfers suggests that the household is in danger of falling into poverty” or “long-term receipt of public transfers indicates that the household is poor.”).

<sup>70</sup> In fact, the poverty mobility/persistence risk factors identified above can easily be listed separately for family allowances, for unemployment benefits, and for aggregated social benefits. When compared with the actual situation (counting all benefits), it would make it possible to construct a more accurate typology of factors for poverty exit and entrance.

<sup>71</sup> For households that are not included, these data are “missing.”

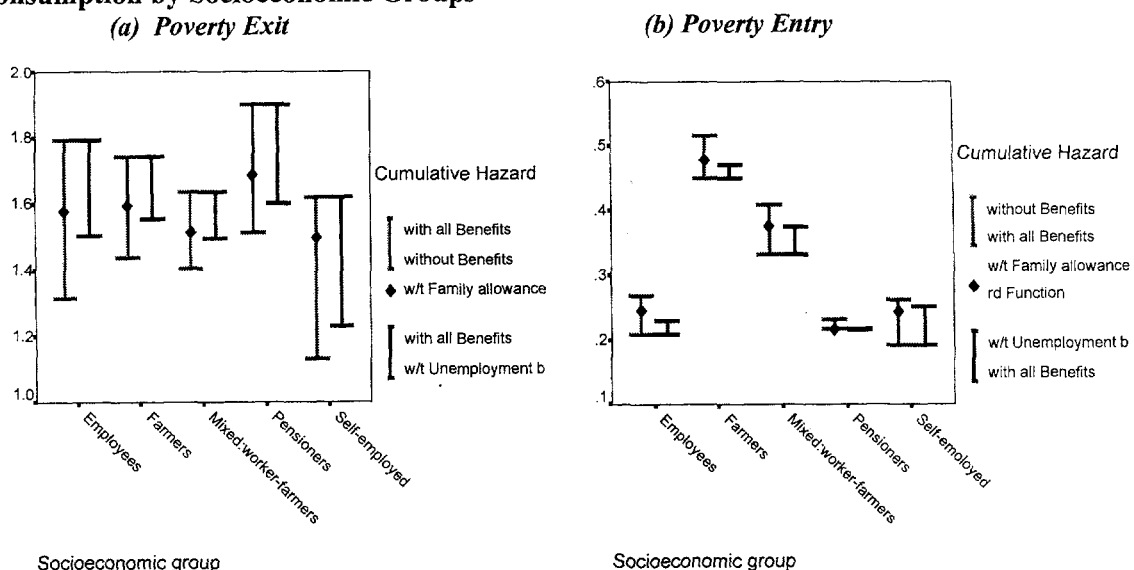
employed. In each of these groups, excluding unemployment benefits would, on average, have a somewhat bigger impact on their ability to move out of poverty than if family allowances were excluded. The relatively large effect of a change in unemployment benefits among households of self-employed accords with the fact that many of the recipients of these benefits were unemployed people attempting to start a small (family) business. The group of households living on welfare as main source of maintenance (welfare recipients) was not included in this comparison because a very small fraction of them remained in this category during the entire period being studied.

The chances of falling into poverty were more differentiated among groups than the chances of moving out of poverty, as presented in Figure 7b. Households associated with agriculture had a much higher risk of being impoverished than all of the other groups. When tested with one-way ANOVA, the differences between socioeconomic groups in terms of poverty hazards were statistically significant in each of the four situations. In the case of poverty exit, the differences were significant only in two situations – when either all benefits or unemployment benefits were not counted.<sup>72</sup> This accords with an earlier impression that the poor are generally less heterogeneous than the non-poor, both in the sense of households' capacities to exit poverty and in the sense of the probability of remaining in poverty for the next instance. This probability is also, on average, less differentiated than the probability of staying out of poverty.

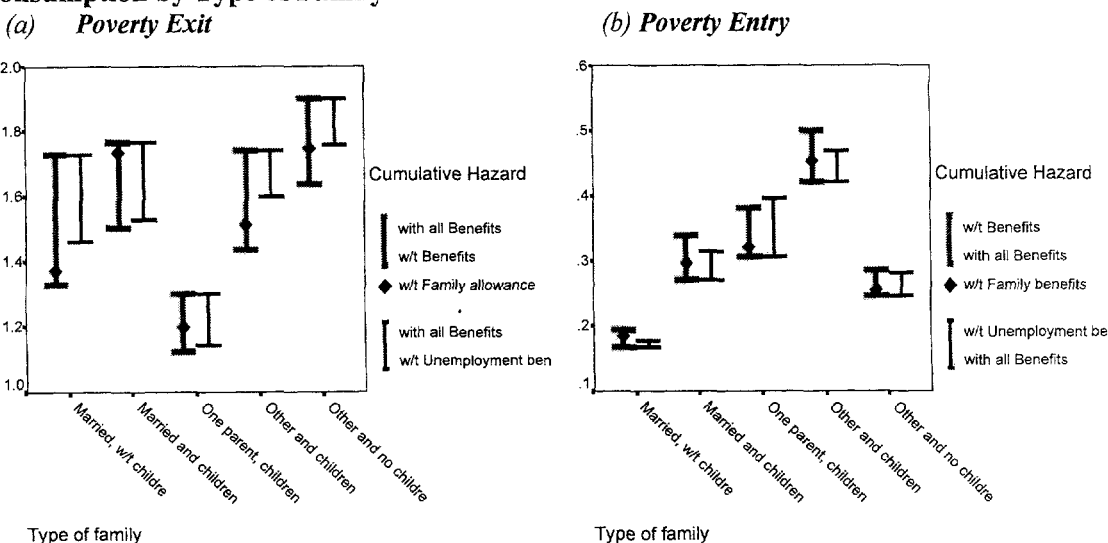
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<sup>72</sup> The same thing happens in many other cases, as the number of characteristics by which the households' chances of falling into poverty varied significantly was much bigger than the number of characteristics by which households differed with respect to moving out of poverty.

**Figure 7: Cumulative Hazards for Poverty Exit and Entry under Alternative Definitions of Consumption by Socioeconomic Groups**



**Figure 8: Cumulative Hazards for Poverty Exit and Entry under Alternative Definitions of Consumption by Type of Family**



In addition to Figure 7a and 7b and 8a and 8b, presenting the hazard to and out-of poverty for socioeconomic groups and types of family, respectively, a series of figures in Appendix C demonstrates these facts: Figures C-1a and C-1b for region; Figures C-2a and C-2b for the household head's educational achievements; Figures C-3a and C-3b for the household size and the dependency ratio; and Figures C-4a and C-4b for the age of the household head. The dimensions along which households' abilities to exit poverty are differentiated in statistically significant way – at least in some of the simulation conditions discussed here – while being also significant in the case of poverty entry involve the following characteristics:

- *Socioeconomic groups.* Households of pensioners followed by households of employees, led the transition out of poverty. Households of farmers, followed by a mixed group (farmer- workers) faced the highest risk of falling into the poverty zone (Figures 7a and 7b). The 'survival' in poverty was not significantly differentiated, but

it varied significantly among those outside the poverty zone, with the self-employed, followed by pensioners and employees, being the relatively least endangered (results available from the author).

- *Type of family.* Families without children other than childless married couples were the most likely to escape from poverty, while single-parent families were the least likely. In terms of the survival function, the order was reversed among poor families – the single-parent families stayed longer in poverty than others (Figures 8a and 8b). The households that were most likely to stay out of poverty were married couples without children and other families without children. All families with children were less likely than others to remain out of poverty, while other households with children and lone-parent families were least likely to survive outside the poverty zone with each next month (more detailed information available from the author on request).
- *Locality and region.* Although the chance of staying out of poverty did not vary significantly among the different locality categories, there was a significant increase in the survival function among the poor either if no benefits were counted or if unemployment benefits were not counted. The poor in large towns and big cities were slightly less in danger of falling into poverty than residents of small towns, but the truly significant difference was between towns and villages (detailed information is available from the author or the unit on request). On the contrary, the regional variation in the poverty exit rate was significantly affected by the social benefits. Figure C-1a shows that households in central regions have gained more than eastern regions in terms of an increased chance of raising out of the poverty zone (as demonstrated by the differences in the cumulative hazard function between the situations ‘with’ and ‘without’ counting social benefits, respectively, for each region). The regions are much more differentiated with respect to the households’ risks of falling into poverty than their chances of exiting poverty (both ‘with’ and ‘without’ social benefits). For instance, according to Figure C-1b, households in North region are generally less endangered by poverty than households in eastern regions (especially, in Central East).
- *The size of the household and the level of dependency.* The chance of staying outside poverty declined as the number of people in a household increased, but the decline was significant only if either all benefits or family allowances were not counted (Figure C-2a in Appendix C). This is consistent with the generally greater level of dependency in larger poor families due to the presence of children rather than adults (potential earners) who would be eligible for unemployment benefits. An increase in the level of the dependency ratio, which did not significantly affect the chance of leaving poverty, significantly increased the likelihood of falling into poverty in an almost linear way in each of the four situations (Figure C-2b in Appendix C). Unemployment benefits were somewhat more important in this respect than family allowances among families with the highest level of dependency – a tendency opposite to that observed above among the poor (suggesting their greater ‘preventive’ impact than in the context of ‘protection’).
- *The age of the household's head.* The hazard to poverty significantly declined as the age cohort of the head of household decreased (Figure C-4a in Appendix C). For households with heads aged over 51 years old, family allowances were slightly more important than unemployment benefits. Although the chances of moving out of poverty did not differ significantly by the head's age, the probability of remaining in poverty for the next time period (month or year) varied significantly if either unemployment benefits or family allowances were not counted. This probability was



relatively lowest for the households headed by persons aged 65 and older, and was highest for households headed by persons aged 51-65 (with households headed by persons from 36 to 50 years old in between).

- *Savings.* There was a clear pattern of a decrease in households' hazard to poverty as the level of the (residual) savings ratio increased, and the decrease was significant for both the actual situation and for each of the three simulated situations (results available from the author). This is consistent with the observation above about the impact of the incidence of savings (indicated by a household's participation in savings transactions during the period under study). The pattern shown by the savings ratio accords with the expectations that households typically draw on their savings, including cushioning themselves against income shocks and smoothing their consumption (Alderman and Paxson, 1992; Deaton, 1991; and Hayashi, 1997). Hazard to outside poverty was somewhat mixed but not significant (confirming once more that chronically poor do not possess financial assets).

### **Final Remarks**

In order to prevent a segmentation and the social exclusion of the poor in Poland (which is a very likely outcome of long-term poverty), it is crucially important to identify the dimensions along which the poverty tends to be structured over time.

The summary of characteristics presented above illustrates how the results of the survival analysis can be used to evaluate the safety net's effectiveness in dealing with long-term poverty. Specifically, it can be used to find out how a change in a social program affects the poverty survival parameters of households belonging to a particular group.

The most general conclusion that emerges from the results presented in this paper is that poverty, as well as vulnerability, is an intrinsically dynamic phenomenon. Also, it needs to be treated by policymakers as a process that is not symmetrical as regards a household's capacity to cope with the risks of entering poverty and remaining in it for a long period of time. In view of this, a well-designed safety net would be one that not only reaches the poor but also recognizes the heterogeneity of need among households with different poverty patterns over time and provides them with help at the time they need it in order to alter their welfare trajectories.

The microsimulation approach taken in this paper makes it possible to assess the consequences of a policy intervention that has already taken place. However, it also makes it possible to evaluate the effects of any change (whether a reduction or an increase) in the social protection system *before* the change is actually made.

## NOTES

<sup>i</sup> The set of 16 categories (groups) of households constituted a classification called “poverty pattern” and was constructed on the basis of information about whether or not a household had entered the poverty zone and, if so, when and for how long. The poverty zone was defined as the lowest quintile of household consumption expenditure *per equivalent adult* (using the OECD coefficients: 1 – householder, 0.7 other adult, 0.5 – child under 14).

<sup>ii</sup> After a series of reforms were undertaken during 1990-91 and 1992-93, unemployment benefits were rather stable throughout the period being studied until 1996 when further restrictions on eligibility were imposed. According to the most recent version, claimants are required to have been working for a minimum of 12 of the previous 18 months, income per person in the family must be below the minimum wage, and the claimant can refuse no more than one job offer. The duration is limited to six months (if lower than the average rate of unemployment in the region) and 18 months (if higher than the average unemployment rate).

For family benefits, which are composed of different programs, there is a set of criteria: (i) in the case of benefits for parents raising children (under 16 or under 20 if in school) income per family member must be below 50 percent of the average wage, and the benefit payment is flat rate (7 percent of the minimum income); (ii) the maternity allowance is paid to working mothers, and the payment depends on her previous wage; (iii) child-care allowances go only to families whose income per member is below 25 percent of the average wage. In the case of “other” benefits (which are sometimes included here with family benefits, some components are family-related, such as birth grants or alimony (state-paid); other benefits such as sickness benefits for the unemployed, are wage-related (80 percent of the employee’s wage).

<sup>iii</sup> Since 1996, the social assistance programs have been specified in the questionnaire as follows: housing supplement; social assistance in cash (with a distinction between those paid “permanently” and “temporarily”); assistance for women in pregnancy and for people raising children; other social assistance; and assistance from charity and other non-government institutions.

<sup>iv</sup> For instance, the average duration of family benefits was about 40 months among households of single-parents and other families with children and among nuclear families with three or more children, compared to only three months among single-person households. The duration is relatively longest -- 32 months -- among the households living on welfare and the mixed group (farmer-workers), followed by households of employees (29 months), but only 11 months among households of farmers and 9 months among pensioners. The group of welfare recipients was the only one that received unemployment benefits for longer than the average (for 28 months), and households of unrelated individuals received these benefits for significantly shorter periods (only for half a month) than family households (from about five to eight months).

<sup>v</sup> Formally, for the case of inflow into the poverty zone, the probability that a household enters poverty at time  $t_i$  with covariates  $Z_{(i)}$ , given that one of the households in  $R(t_i)$  – the set of all households who have not yet entered the poverty zone at a time just prior to  $t_i$  – entered poverty at this time, is given by

$$\begin{aligned} & \Pr [\text{household enters poverty at } t_i \mid \text{one entered poverty at } t_i] \\ &= \Pr [\text{household enters poverty at } t_i \mid \text{survival to } t_i] / \Pr [\text{one entered at } t_i \mid \text{survival to } t_i] \\ &= h(t_i \mid Z_{(i)}) / \sum_{j \in R(t_i)} h(t_i \mid Z_j) \end{aligned}$$

<sup>vi</sup> **Survival variable** *Outflows from poverty*: For transition out of poverty, the survival variable was defined in terms of the number of months during which a household remained in the poverty zone, during the period under study. Only those households who entered the poverty zone during that period were included, regardless of whether or not they completed their poverty spell within it, that is, a right censored observation was treated as another state of destination.

*Inflows into the poverty zone*: For poverty avoidance (that is a left censored observation) the survival variable is the number of months during which a household stayed outside of the poverty zone, since the beginning of the period under study until it fell into the poverty zone. Included are both those households that, after falling into poverty, remained in it for the rest of the period (if a household began its right censored poverty spell) and those who experienced only a transitory or recurrent poverty (if a household completed its poverty spell within the period, or fell into it again). However, despite of keeping the two situations as different in the classification of the outcome – i.e., of the status variable – the time of recurrent poverty escape was not included into calculating survival for the poverty avoidance. The reason is that confining the calculations to the completed out-of-poverty spell allows for assessing the household’s survival time before it experienced poverty

Time interval variable. The four year period is divided into four 12 months intervals. For completed poverty spell, and for right censored observations, the variable ranges from 0 to 36 months, excluding are left and double censored observations. Same range is for left censored observations; only for double censored observations does the variable range up to 48 months. In the case of inflows into the poverty zone, when the intervals complement the whole period to the time of beginning a poverty spell, the intervals are as in the first case, from 0 to 36 (with never poor households excluded).

Status variable. It is built as a partition of the set of poverty patterns over time. For outflow from poverty, a set of five possible outcome (state of destination) was defined: poverty spell begun and completed – poverty spell right censored, poverty spell left censored (and completed) – poverty spell double censored, either with interrupted poverty spells (recurrent poverty) or without (permanently poor) – and no poverty spell (never poor cases). For inflow into the poverty zone, the set of four outcome embraced: poverty avoided (never poor cases) – poverty spell entered and completed – poverty spell entered and not completed – and poverty spell entered and not interrupted (permanently poor).

<sup>vii</sup> In this case, the hazard function at  $t$  is conditional on the values of  $Z$ , a vector in which assembled are time-invariant regressors: 
$$h(t;Z) = \lim_{\Delta t \rightarrow 0} \frac{\Pr(t \leq T < t + \Delta t | T \geq t, Z)}{\Delta t}$$

[The hazard is determined for the households who are homogeneous with respect to  $Z$ .]

<sup>viii</sup> The duration is limited to 6 months (if there is a lower than average rate of unemployment in the region) to 18 months (if there is a higher than average unemployment rate). In the case of family benefits it varies greatly, the possible longest being in the case of family allowances on dependent child (until age 16, or 20 years old if in school); child-care allowances - up to age 2; sickness benefits - up to age 6 months (in an exceptional cases, up to age 9 months); maternity allowances - age 16 to 26 weeks.

<sup>ix</sup> For instance, only family allowances were slightly higher consistently during all four years among non-vulnerable households who entered and exited poverty during the period under study. All other benefits, as well as all poverty groups, including never poor, showed mixed patterns across the years.

<sup>x</sup> It might be of practical interest to make a comparison between particular types of benefits with respect to their relative impact on poverty status over time while using a summary indicator. For the case of the survival function, one can use a complement to the unity of the ratio of the baseline value to its respective value without the benefit (without counting consumption attributed to it). While taking average over the time intervals (omitting the first, 'zero' interval and the last as irrelevant) such a summary indicator would tell us about the relative capacity of the social program in protecting the poor against a longer-term poverty. [For the case of the hazard rate, the ratio needs to be reversed -- the second ('without') to the first ('baseline') value. However, such a type of indicator can be used only if a dominance between the compared parameter values is not preserved, as it is illustrated by the case of family benefits and the baseline model. But it is useful in the other cases.] For instance, comparison of the survival function for the programs mentioned in Table 4 would allow one to conclude that unemployment benefits alone have almost as high an impact on protecting the recipient households as the social benefits taken jointly. Withdrawing the former would result in an increase of the risk of staying in prolonged poverty by a similar degree (0.199) as it would be when the latter was withdrawn (0.217). For the case of the hazard rate, the order between the three types of benefits – with respect to their relative contribution to a household's ability to exit poverty – would look as follows: total social benefits (0.252); unemployment compensation (0.246); and family benefits (0.177).

<sup>xi</sup> In 1993, 5 percent out of 15.6 percent of households who reported the presence of an unemployed member did not receive unemployment benefit; in 1994, the figures was 5.7 out of 15.6 percent; in 1995 - 10.4 out of 14.6 percent, and in 1995 - 8.5 out of 12.5 percent.

<sup>xii</sup> The first group was composed of households for whom it was possible to observe the time-to-event that ended when a household began its poverty spell. It means that most of them are exactly the same households for whom the poverty duration has already been analyzed (except for those with recurrent poverty pattern as they are also included here), with the focus now on their pre-poverty history that might have lasted from one to three years (again, for strictly computational reasons, the years are converted into months). The second group was composed of households who remained beyond the poverty zone over the whole period under study.

<sup>xiii</sup> With exception of unemployment benefit, the summary indicator is much lower than previously, ranging from 0.037 for non-vulnerable to 0.081 for vulnerable in the case when all social benefits were not counted; in the case of unemployment benefit it equal 0.136 and 0.292 for non-vulnerable and vulnerable recipients, respectively, and in the case of family benefits the analogous figures are only 0.028 and 0.032.

<sup>xiv</sup> The specification comprises: (i) the concept of the household's poverty pattern over time and its derivatives – the time variable (the dependent variable, in other words, the number of months that the household remained in or outside of the poverty zone); (ii) the status variable associated with the survival (time) variable, with multiple destinations for transition in and out of the poverty zone (in other words, poverty spell completed or right-censored); and (iii) the way of dealing with the problem of behavioral response (by stratifying households by vulnerability status). Also, the differences in the cumulative hazard functions,  $\Delta(H)$ , and the survival functions,  $\Delta(S)$ , calculated for the cases “with” and “without” social benefits respectively, are used here for measuring the overall impact of a social program on poverty status over time among the households distinguished by characteristics that are traditionally of particular interest of social policy in Poland (such as socioeconomic groups or type of family).

<sup>xv</sup> In the SPSS-Coxreg program used here, the assumption about the constant hazards ratio over time between the sub-groups distinguished by vulnerability status was checked using the Nelson-Aalen estimator of the cumulative hazard rate for both sub-groups (say,  $Z=1$  if vulnerable and  $Z=0$  if not). If the proportional hazards model was correct, then,  $H(t|Z=1) = e^{\beta}(t|Z=0)$ , so that a plot of  $\ln[\hat{H}(t|Z=1)] - \ln[\hat{H}(t|Z=0)]$  versus  $t$  should be roughly equal to  $\beta$ .

<sup>xvi</sup> The following categories of family were defined: 1 - married couple without children; 2 - married couple with 1 to 2 children; 3 - married couple with 3 or more children; 4 - other families with children (mostly one-parent families); 5 - other families without children; 6 - single-person households.

<sup>xvii</sup> For instance, 56 percent of households reported participating in private transfers (either giving or receiving) during the 1993-96 period, and 57 percent among the “never poor” reported such transfers. The analogous figures for public transfers (excluding pensions) were 79 percent in total and 77 percent among the “never poor.” For credits from banks, they were 61 percent and 62 percent respectively. For borrowing money from private sources, they were 27 percent and 25 percent. Only in the case of possessing a savings account did a higher fraction of the never poor (56 percent) report this than others (48 percent).

## REFERENCES

- Alderman, H., and Ch. Paxson, 1992, "Do the Poor Insure? A Synthesis of the Literature on Risk and Consumption in Developing Countries", Policy Research Working Paper 1008, The World Bank, Washington, D.C.
- Atkinson, A. B., 1998, "Microsimulation and Policy Debate: A Case Study of the Minimum Pension Guarantee in Britain". DAE Working Paper 9815; University of Cambridge, UK.
- Cox, D., Jimenez, E., and W. Okrasa, 1997, " Family Safety Net During Transition in Poland" *Review of Income and Wealth*, Series 43, No.2 (June): 191-209.
- Deaton, A., 1991 "Saving and Liquidity Constraints", *Econometrica*, Vol. 59 (5): 1221-1248.
- De Melo, M, Denizer, C., and A. Gelb, 1996 "From Plan to Market: Poatterns of Transition" Working Paper No. 1564, World Bank, Washington, D.C.
- Duncan, G. J. and others, 1993 "Poverty Dynamics in Eight Countries" *Journal of Population Economics*, Springer-Verlag; pp. 215-234.
- Glewwe, P., and G. Hall, 1995 "Who is Most Vulnerable to Macroeconomic Shocks? Hypotheses Tests; Using Panel Data from Peru," LSMS Working Paper No. 117.
- Golinowska, S., 1994 "Public Social Expenditures", in GUS, IPiSS, UNICEF Occasional Papers No. 4, Warsaw
- Grooteart, Ch. and J. Braithwaite, 1998, "Poverty Correlates and Indicator-Based Targeting in Eastern Europe and the Former Soviet Union", Policy Research Working Paper 1942, The World bank, Washington, D.C.
- \_\_\_\_\_, R. Kanbur and G-T Oh, 1995, "The Dynamics of Poverty: Why Some People Escape From Poverty and Others Don't. An African Case Study," Policy Research Working Paper 1499, The World Bank, Washington, D.C.
- Grosh, M, 1994 "Administering Targeted Social Programs in Latin America: From Platitudes to Practice", World Bank, Washington, D.C.
- GUS, Główny Urząd Statystyczny (Central Statistical Office), 1994, "Budżety Gospodarstw Domowych", different issues: 1993, 1994, 1995, 1996. Informacje i Opracowania . Warszawa .
- \_\_\_\_\_, 1991 "Prognoza ludności Polski według województw na lata 1990-2010. Wersja pomigracyjna" materiały i Opracowania Statystyczne, Warszawa
- \_\_\_\_\_, IPiSS, UNICEF, 1994, Social Policy and Social Conditions in Poland 1989 –1993" Institute of Labour and Social Studies Occasional Papers, No. 4, Warsaw
- Hayashi, F., 1997, "Understanding Savings: Evidence from the United States and Japan", The MIT Press: Cambridge, Massachusetts ,

- Hill, M. S., 1992, "Some Dynamic Aspects of Poverty" in Hill, M. S., Hill D. H., and James N. Morgan "Five Thousand American Families – Patterns of Economic Progress", vol. IX., ISR, The University of Michigan, Ann Arbor.
- Jakobiak, B., and M. Jeznach, 1999 "'Szara gospodarka' w Polsce", *Wiadomosci Statystyczne*, GUSPTS, XLIV (Kwiecien): 12-17.
- Jalan, J and M. Ravallion, 1998, "Determinants of Transient and Chronic Poverty" Policy Research Working Paper 1936, The World Bank.
- Johnson, S., Kauffmann, D., and A. Shleifer, 1997 "The Unofficial Economy in Transition. Brooking Paper on Economic Activity", vol. 2: 159-239.
- Kalaska, M., and J. Witkowski, 1996, "Unregistered Employment in Poland in 1995", Central Statistical Office (GUS), Warsaw.
- \_\_\_\_\_, \_\_\_\_\_, 1997, "Rynek pracy w Polsce. Kontynuacja korzystnych tendencji" *Studia i Analizy Statystyczne*, GUS, Warszawa.
- Keane, M. and E. Prasad, 1999, "Consumption and Income Inequality in Poland During the Economic Transition" IMF Working Paper 99, Washington D.C.
- Klein J. P. and M.L. Moeschberger, 1997, "Survival Analysis. Techniques for Censored and Truncated Data", Springer-Verlag: New York Inc.,
- Kordos, J., 1995, "Nonresponse Problems in Polish Household Surveys", *Statistics in Transition*, vol. 2, No 5: 789-812.
- Lancaster, T., 1990, "The Econometric Analysis of Transition Data", Cambridge University Press: Cambridge.
- Lanjouw, P. and M. Ravallion, 1995, "Poverty and Household Size", *The Economic Journal*, vol. 105 (November).
- \_\_\_\_\_, Milanovic. B. and S. Paternostro, 1987, "Poverty and the Economic Transition. How Do Chnganges in Economies of Scale Affect Poverty Rates for Different Households?" Policy Research Working Paper 2009, The World Bank, Washington, D.C.
- Milanovic, B., 1998a, "Income, Inequality, and Poverty during the Transition from Planned to Market Economy" The World Bank, Washington, D.C.
- \_\_\_\_\_, 1998b, "The Role of Social Assistance in Addressing Poverty", Mimeo, The World Bank, Washington, D.C.
- National Research Council, 1991, "Improving Information for Social Policy Decisions: The Use of Microsimulation Modelling", Vol I: Citro F. C. and E. A. Hanushek, eds., "Review and Recommendations", National Academy Press: Washington , D.C.
- \_\_\_\_\_, 1995, "Measuring Poverty. A New Approach", Citro F. C., and R. T. Michael, eds., National Academy Press, Washington, D.C.
- Newell, A. and M. Socha, 1998 "Wage Distribution in Poland: The Roles of Privatization and International Trade, 1992-96" *The Economic of Transition*, vol. 6 No. 1: 47-65.

- OECD, 1998 "Economic Surveys: Poland 1998", Paris
- Okrasa, W., 1999 "Who Avoids and Who Escapes From Poverty During the Transition. Evidence from Polish Panel 1993-96, Policy Research Working Paper 2218, The World Bank., Washington, D.C.
- \_\_\_\_\_, 1994, "The Poor Before and During the Transition: A Panel Study of Temporal Aspects of Poverty in Poland, 1987 - 1992", The World Bank, Washington, D.C. (Mimeo).
- \_\_\_\_\_, 1988, "Redistribution and the Two Dimensions of Inequality: An East-West Comparison," *European Economic Review*, No. 32: 633-643.
- Ruggles, P. and R. Williams, 1989 "Longitudinal Measures of Poverty: Accounting for Income and Assets over Time", *Review of Income and Wealth*, Series 35. No. 3: 225-243.
- Rutkowski, J., 1996 "High Skills Pay off: The Changing Wages Structure during Economic Transition in Poland" *Economics of Transition*, Vol. 4: 89-112.
- \_\_\_\_\_, 1998, "Labor Markets, Welfare and Social Policy during Economic Transition in Poland", Mimeo (May) The World Bank, Washington, D.C.
- Rutkowski, M., (ed.), 1999 "Russian Social Protection Malaise: Key Reform Priorities as a Response to the Present Crisis", Social Protection Discussion Paper No. 9909, The World Bank, Washington, D.C.
- UNDP, 1998, "Human Development Report 1998". Oxford University Press: New York.
- Van de Wall, D, Ravallion, M. and G. Datt, 1994, "How Well Does the Social Safety Net Work?. The Incidence of Cash Benefits in Hungary, 1987-89" , LSMS Working Paper No 102, The World Bank, Washington, D.C.
- Warsaw School of Economics, 1994, "Transforming the Polish Economy", Warsaw.
- Witkowski, J., 1999, "Ludnosc i rynek pracy w Polsce w perspektywie roku 2020", Wiadomosci Statystyczne GUS-PTS, XLIV (Luty): 34-44.
- World Bank 1999, (WDR) "World Development Report: Knowledge for Development", Oxford University Press: New York.
- \_\_\_\_\_, 1998 "World Bank Atlas 1998", The World Bank, Washington, D.C.
- \_\_\_\_\_, 1995 "Understanding Poverty in Poland". A World Bank Country Study, Washington, D.C.
- \_\_\_\_\_, 1994 "Poland. Policies for Growth and Equity", A World Bank Country Study, Washington, D.C.

**Table A-1. Poverty pattern frequency distributions under alternative definitions of household consumption by adjusting it to income from social benefits.**

Poverty pattern over four year period *		Frequency distributions of households by poverty status over time							
		Total consumption		If not counted:					
				All social benefits-derived consumption <sup>a</sup>		Consumption derived from family benefits <sup>b</sup>		Consumption derived from unemployment benefit <sup>c</sup>	
		Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent
1.	0 1 1 1	121	2.5	126	2.6	114	2.3	124	2.5
2.	0 0 1 1	108	2.2	115	2.3	109	2.2	128	2.6
3.	0 0 0 1	187	3.8	182	3.7	180	3.7	183	3.7
4.	0 0 0 0	3055	62.1	2609	53.0	2828	57.5	2851	58.0
5.	1 0 0 0	223	4.5	270	5.5	256	5.2	238	4.8
6.	1 1 0 0	98	2.0	137	2.8	127	2.6	110	2.2
7.	1 1 1 0	98	2.0	129	2.6	126	2.6	107	2.2
8.	1 1 1 1	288	5.9	510	10.4	399	8.1	356	7.2
9.	0 1 1 0	86	1.7	92	1.9	83	1.7	92	1.9
10.	0 1 0 0	156	3.2	161	3.3	160	3.3	163	3.3
11.	0 0 1 0	172	3.5	173	3.5	179	3.6	183	3.7
12.	1 0 0 1	81	1.6	83	1.7	76	1.5	84	1.7
13.	1 0 1 1	62	1.3	97	2.0	68	1.4	89	1.8
14.	1 1 0 1	85	1.7	99	2.0	94	1.9	90	1.8
15.	1 0 1 0	48	1.0	73	1.5	64	1.3	58	1.2
16.	0 1 0 1	51	1.0	63	1.3	56	1.1	63	1.3
	Total	4919	100.0	4919	100.0	4919	100.0	4919	100.0

\*) "1" represents a year in poverty zone (in 1<sup>st</sup> quintile by household consumption expenditure per equivalent adult) and '0' represents a year out of poverty. a, b, c – an adjustment factor for consumption derived from a given type of benefit was defined as follow: household consumption per equivalent adult x (income from benefit/total household disposable income).



**Table A-2. Determinants of welfare change during 1993-96 -- fixed effect model of consumption** (for assessing the propensity to consume out of social benefits)

Variable	Change in consumption expenditure:					
	1993-94		1994-95		1995-96	
	Coefficient	Std. Error	Coefficient	Std. Error	Coefficient	Std. Error
(Constant)	-74.551	28.876*	-52.352	31.785**	32.308	37.783**
Head elementary school diploma	11.906	11.415	-6.370	11.753	-1.364	14.046
Head vocational school diploma	13.113	12.275	-8.202	12.543	3.022	14.945
Head high school diploma	15.018	12.453	-3.481	12.664	.787	15.060
Head university diploma	-1.919	14.159	5.144	14.214	3.783	16.860
Total number of school years	-6.31E-2	.331	-.380	.323	.560	.384
Change in number of school years	-1.063	.375*	-1.001	.375*	-.970	.461*
Age of head	2.557	.903*	2.622	.873*	-.508	1.015*
Age of head squared	-2.21E-2	.009*	-2.75E-2	.009*	6.532E-3	.010*
Number of adults women	.904	4.270	1.880	4.114	.801	4.753
Change in number of adult-women	-17.259	5.672*	-19.817	5.434*	-19.921	6.322*
Number of adults men	3.356	4.364	4.025	4.161	-4.866	4.890
Change in number of adult-men	-17.432	5.295*	-2.246	5.283	-22.162	6.444
Number of elderly	6.330	4.851	3.749	4.647	-4.764	5.448
Change in number of elderly	-5.745	7.492	-19.725	7.854*	-22.794	9.245*
Housing amenities	2.817	5.670	24.156	6.004*	-8.100*	6.989*
Change in housing amenities	6.373	6.070	19.380	5.168*	3.540*	7.380*
Agricultural land area	1.215	11.804	-.319	10.914	1.216	9.956
Change in area of agricultural land	-1.943	11.663	-.476	10.727	3.950	8.678
Plot of land	-31.666	10.777*	-7.353	10.482*	-.561	12.265
Change in plot of land	31.672	12.265*	4.462	11.708*	4.742	13.893
Female head	6.056	4.272	-6.272	4.077	2.582	4.781
<i>Social benefits</i>	.297	.129*	-6.35E-2	.127*	-.437	.159
<i>Change in social benefits</i>	.583	.094*	.675	.107*	.404	.128*
Head employed	-23.083	18.634	-2.012	22.573	-29.646	27.105
Head unemployed	-9.065	21.569	26.047	24.573	5.778	28.965
Head pensioner	-19.648	19.027	-1.613	22.786	-26.086	27.410
Change in head labor status	8.017	6.890	1.222	6.858	9.133	8.295
Head in public sector	1.143	4.550	-2.765	4.381	8.921	5.226
Change of head's employment sector	-4.084	6.287	6.227	6.666	-3.533	7.810
Big city	3.415	4.886	.469	5.812	9.555	6.835

\*) Indicates significance at 0.05 confidence level; \*\*) Indicates significance at 0.10 confidence level.

**Table A-3a.** The long-term poverty determinants – number of years in the poverty zone under alternative definitions of consumption regressed on household head's school years, unemployment incidence in the household, number of children under 15, urban-rural and region.

Variables	Full consumption counted	Not counted social benefits	Not counted unemployment benefits	Not counted family benefits
(Constant)	1.876 (.167)	2.269 (.174)	1.860 (.164)	2.174 (.176)
School year of HH head (93)	-0.147* (.013)	-0.175* (.013)	-0.148* (.012)	-0.170* (.013)
Unemployment Years (all Members)	0.308* (.029)	0.588* (.030)	0.579* (.029)	0.334* (.031)
Nr. of children under 15	0.316* (.026)	0.368* (.027)	0.300* (.026)	0.392* (.028)
URBAN	-0.205* (.056)	-0.145* (.058)	-0.181* (.055)	-0.192* (.059)
North East	-0.095 (.129)	-0.082 (.134)	-0.049 (.126)	-0.081 (.135)
North	0.327* (.114)	0.367* (.118)	0.326* (.112)	0.370* (.119)
South	0.008 (.100)	0.020 (.105)	0.045 (.099)	0.007 (.106)
South East	0.275* (.102)	0.359* (.107)	0.305* (.101)	0.353 (.108)
Central East	0.464* (.130)	0.491* (.135)	0.495* (.127)	0.471* (.136)
Central	0.056 (.115)	0.078 (.120)	0.081 (.113)	0.084 (.121)
Central West	0.429* (.103)	0.492* (.107)	0.474* (.101)	0.452* (.108)
South West	0.250** (.114)	0.338* (.119)	0.279* (.112)	0.284** (.120)
R <sup>2</sup> adj	0.206	0.301	0.290	0.232
N (households)	4,919	4,919	4,919	4,919

\*Indicates significance of 0.01 confidence level; \*\* Indicates significance at 0.05 confidence level.

**Table A-3b. Associations between the number of years in poverty zone and the number of years during which household was receiving a given type of benefits, or was taking money from non-income sources of welfare, by type of residency and vulnerability status.**

Number of years receiving benefits	Total	Urban	Rural	Non-vulnerable	Vulnerable
Values of t-statistics					
Social benefits					
Any kind of benefits	22.01	17.68	15.53	13.80	15.16
Family benefits	27.90	22.60	17.20	18.05	18.23
Unemployment benefits	18.80	16.03	10.27	13.94	11.10
Local benefits	-1.93*	-0.49 <sup>n</sup>	0.092 <sup>n</sup>	-3.78	1.37 <sup>n</sup>
Other benefits	5.22	5.41	2.11	4.10	3.00
Other sources					
Dissaving	-12.78	-9.61	-6.87	-9.47	-7.54
Formal credit	-3.60	-1.66	-3.01	-2.40	-2.30
Informal credit	6.56	6.74	4.01	3.67	4.24

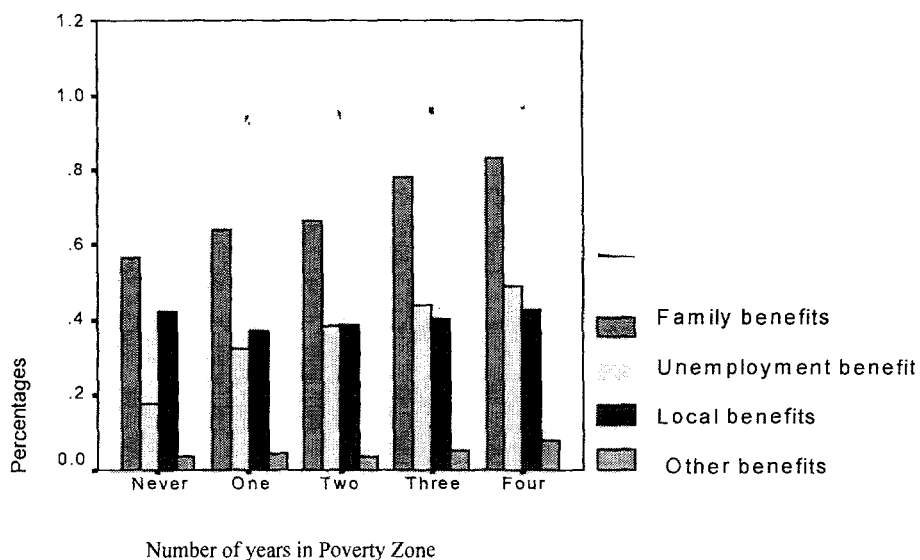
\*) Significant at 0.05; Unmarked are significant at 0.01; <sup>n</sup>) No significant

**Table A-4. Number of years in poverty zone regressed on the time period (number of years) of receiving a given type of benefit**

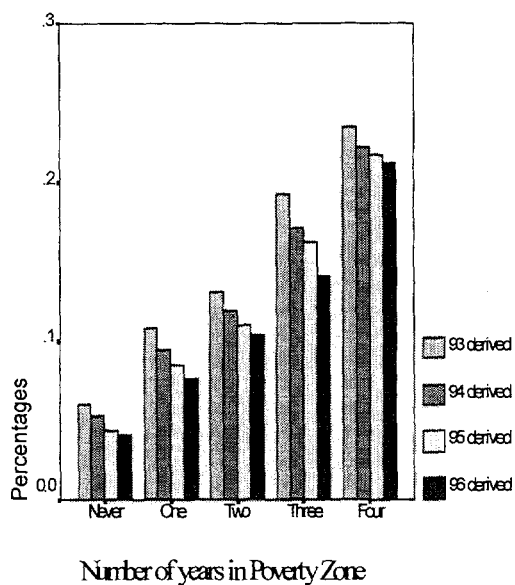
Number of years Receiving benefits	Total	Urban	Rural	Non-vulnerable	Vulnerable
Constant	0.279 (.026)	0.045 (0.032)	0.050 (0.045)	0.227 (0.024)	0.532 (0.063)
Family benefits	0.259 (0.011)	0.239 (0.012)	0.288 (0.019)	0.157 (0.010)	0.369 (0.023)
Unemployment benefit	0.289 (0.021)	0.289 (0.025)	0.257 (0.037)	0.217 (0.021)	0.334 (0.044)
'Local' benefits	-0.007 (0.014)	-0.002* (0.015)	-0.009 (0.030)	-0.002 (0.013)	-0.004 <sup>n</sup> (0.032)
Other benefits	0.159 (0.055)	0.193 (0.062)	0.002 <sup>n</sup> (0.100)	0.129 (0.053)	0.210* (0.110)
R <sup>2</sup> _adjusted	0.174	0.186	0.160	0.126	0.212
Number of households	4,919	3,036	1,881	3,393	1,524

\* ) Significant at 0.05 or 0.10; Unmarked significant at 0.01; <sup>n</sup>) Not significant.

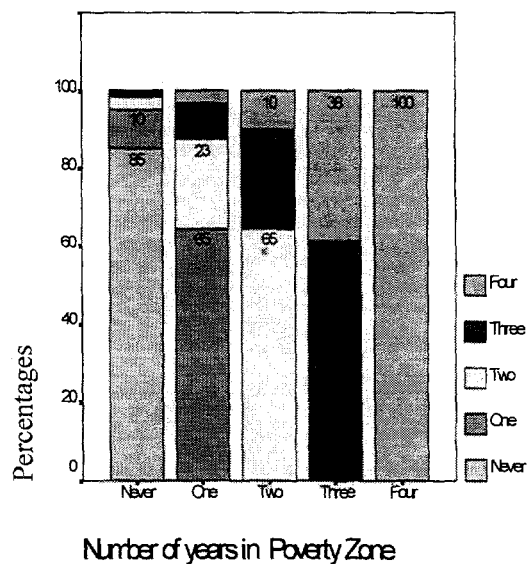
**Figure A-1. Fractions of households receiving given type of benefits during 1993-96**



**Figure A-2. Shares of consumption derived from social benefits by number of years in poverty**



**Figure A-3. Changes in poverty status over time if benefit-derived consumption was not counted, by number of years in poverty**



**Table B-1a. Duration of the poverty spell by the level of welfare dependency – the number of social programs used by a household during the four year – and by locality.**

Welfare dependency		Poverty spell duration: the median time of being in poverty zone (in months)			
Level	Fraction of recipients %	Poverty spell completed or right censored		Left censored poverty spell	
		Urban	Rural	Urban	Rural
None	20.6	21.7	21.8	21.0	24.4
Low	39.2	20.6	22.0	23.8	24.2
Medium	30.4	23.2	23.7	23.5	24.2
High	9.9	22.6	23.3	29.0	29.1
Total	100.0	xx	xx	xx	xx

**Table B-1b. The poverty spell duration by the number of years household participated in family benefits, and in unemployment benefits**

Program-duration dependency	Fractions of recipients		Poverty spell duration: the median time of being in the poverty zone (in months)			
			Family benefits		Unemployment benefit	
	Family benefits	Unemployment benefit	Urban	Rural	Urban	Rural
None	25.6	57.9	21.6	21.4	21.3	22.5
One year	7.8	22.1	20.3	23.0	22.7	21.8
Two years	11.6	13.6	21.2	22.1	26.7	22.5
Three years	15.5	4.9	22.5	23.5	24.9	27.4
Four years	39.6	1.8	23.3	24.0	18.0	24.0
Total	100.0	100.0	xx	xx	xx	Xx

## Appendix B

**Table B-2. Impact of social transfers on poverty duration under alternative definitions of household consumption**

	Poverty spell duration: the median time of being in poverty zone under alternative definitions of household consumption (in months)						
	Full consumption	If not counted:					
		All social benefits		Family allowances		Unemployment compensation	
		Recipient	All	Recipient	All	Recipient	All
All households	22.3	26.5	26.0	25.4	23.5	28.8	23.8
<i>Locality</i>							
Urban	22.0	26.8	26.7	26.7	23.4	30.1	24.0
Rural	22.5	26.0	25.3	25.3	23.5	27.1	23.6
<i>Vulnerability</i>							
Non-vulnerable	20.3	23.6	23.4	22.2	21.5	27.4	21.6
Vulnerable	25.7	29.1	28.6	28.7	26.5	29.6	27.3

**Table B-3. The impact of social benefits on remaining in prolonged poverty or on exiting the poverty zone: values of the survival function and the hazard rate.**

Interval start time	Remaining in poverty under alternative definitions of household consumption							
	Total consumption		If not counted:					
			All social benefits		Family benefits		Unemployment benefits	
	Survival function	Hazard Rate	Survival function	Hazard Rate	Survival Function	Hazard Rate	Survival Function	Hazard rate
0.0	1.00	0.000	0.91	0.006	0.93	0.006	0.92	0.007
12.0	0.41	0.069	0.66	0.034	0.55	0.043	0.71	0.028
24.0	0.33	0.084	0.45	0.063	0.22	0.071	0.40	0.072
36.0 <sup>+</sup>	0.00	xx	0.05	xx	0.01	xx	0.01	xx

**Table B-4. Preventative impact of social benefits on remaining outside the poverty zone – the survival function, by the vulnerability status of households during 1993-1996.**

Interval start time	Survival function under alternative definitions of household consumption							
	Total consumption		If not counted:					
			All social benefits		Family benefits		Unemploy ment benefits	
	Non- vulnerable	Vulnerable	Non- vulnerable	Vulnerable	Non- vulnerable	Vulnerable	Non- vulnerable	Vulnerable
0.0		.000	1.000 (1.000)*	1.000 (1.000)	1.000 (1.000)	1.000 (1.000)	1.000 (1.000)	1.000 (1.000)
12.0	0.924	0.826	0.900 (0.923)	0.765 (0.807)	0.895 (0.911)	0.779 (0.789)	0.821 (0.882)	0.624 (0.728)
24.0	0.873	0.707	0.838 (0.874)	0.631 (0.691)	0.838 (0.865)	0.645 (0.669)	0.696 (0.818)	0.377 (0.558)
36.0 <sup>+</sup>	0.847	0.605	0.804 (0.842)	0.534 (0.595)	0.805 (0.834)	0.548 (0.574)	0.630 (0.777)	0.239 (0.405)
Number of households	4,919		3,908		3,081		1,266	

\* In parenthesis are values calculated for recipients only.

Table C1. Hazard function for poverty exit, under alternative definitions of consumption – the proportional hazard model estimates

Variables	Counting full		If not counted			
	consumption		Family allowances		Unemployment benefits	
	Coefficients	Standard Error	Coefficients	Standard Error	Coefficients	Standard Error
<b>Head of Household</b>						
Age	-2.07E-04	.0041	3.367E-04	.0045	4.132E-05	.0043
<i>Education</i>						
Elementary or below	-.3802	.2529	-.4548	.2852	-.3649	.2560
Vocational or some HS	-.3717	.2482	-.4277	.2809	-.3297	.2501
High school or some college	-.3877	.2551	-.4416	.2884	-.3345	.2583
University (omitted)						
Female head	.0404	.1163	.0153	.1269	.1188	.1234
<i>Marital status</i>						
Never married	.2250	.2000	.1043	.2018	.0960	.2055
Married	.0272	.1106	.0011	.1193	.0245	.1152
Widowed	-.1358	.1650	-.2420	.1743	-.1836	.1702
Divorced (omitted)						
<b>Family Type</b>						
Married w/t children	.0085	.1996	.0310	.2129	.0234	.2026
Married w/ 1-2 children	-.0542	.1986	-.2026	.2087	-.1303	.2031
Married w/ 3 or more children	-.2402	.2175	-.4828*	.2374	-.2582	.2229
Other with children	-.1805	.1799	-.2471	.1879	-.2971*	.1839
Other without children	-.0428	.1696	-.0162	.1754	-.2046	.1730
Single-person in HH (omitted)						
Disabled person in HH	-.0155	.0928	-.0081	.0982	-.0451	.0978
<b>Head's employment sector</b>						
Public sector	-.1140	.1196	-.0471	.1360	-.2529*	.1242
Private sector	-.0897	.1065	.0054	.1182	-.1839*	.1105
<b>Socioeconomic group</b>						
Employees	-.1362	.1521	-.0781	.1641	.0525	.1550
Farmers and a mixed group	-.1175	.1463	-.1566	.1559	-.0862	.1495
Self-employed	-.1311	.2292	-.1602	.2454	-.0117	.2330
Welfare recipients	-.1648	.2475	-.2660	.2900	-.3872	.3162
Pensioners (omitted)						
<b>Access to non-income sources and transfer participation</b>						
Possessing savings account	.0211	.1720	.0086	.2029	.0290	.1718
Credit and loan transactions	-.2280	.2977	.1072	.3925	-.1950	.2991
Participate in private transfers	-.0522	.1060	-.0375	.1204	.0866	.1082
Participate in public transfers	-.0988	.1120	-.2007*	.1160	-.0797	.1141
<b>Poverty spell began</b>						
in 1995	-.5935*	.0911	-.6486*	.0935	-.6237*	.0902
in 1996	-1.1358*	.1114	-1.0810*	.1075	-1.0238*	.1066
in 1994 (omitted)						
Cases available for the analysis	798		785		829	
-2 Log Likelihood	8671.679		7169.939		8083.290	
	Chi-Square	df Sig	Chi-Square	df Sig	Chi-Square	df Sig
Overall (score)	130.099	25 .0000	143.845	25 .0000	132.348	25 .0000

\*) Significant at 0.10 level

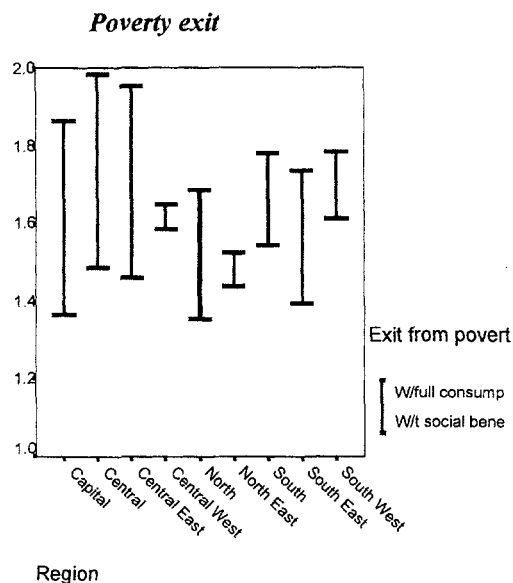


TABLE C-2. Hazard to poverty, under alternative definitions of consumption – the proportional hazard model estimates

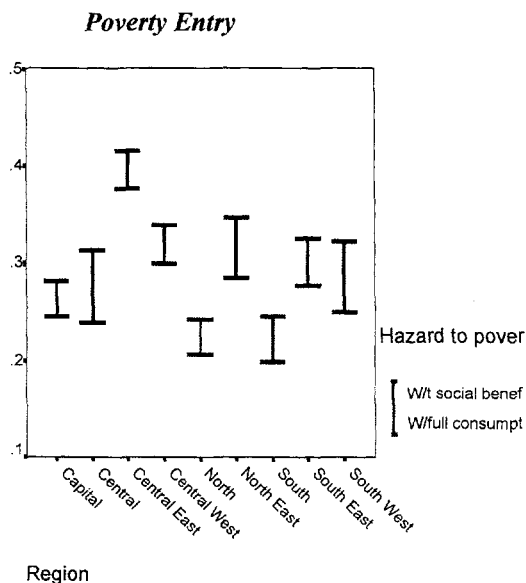
Variable	Counting full consumption		If not counted			
	Coefficients	Standard Error	Family allowances		Unemployment benefits	
			Coefficients	Standard Error	Coefficients	Standard Error
<b>Head of Household</b>						
Age	-.0068	.0043	-.0062	.0043	-.0073*	.0041
<b>Education</b>						
Elementary or below	1.1900*	.2506	1.2445*	.2457	1.2023*	.2205
Vocational or some HS	1.0347*	.2465	1.0772*	.2412	1.0008*	.2155
High school or some college	.7218*	.2511	.7267*	.2455	.6178*	.2200
University (omitted)						
Female head	.0154	.1134	-.0335	.1124	-.0578	.1102
<b>Marital status</b>						
Never married	.1059	.1996	.0460	.1920	.1926	.1953
Married	.0584	.1125	.0957	.1117	.0866	.1098
Widowed	-.1404	.1601	-.0988	.1615	-.1310	.1616
Divorced (omitted)						
<b>Family Type</b>						
Married without children	.0194	.1995	.1649	.1992	.0325	.1946
Married and 1-2 children	.2437	.2011	.4815*	.2000	.2936	.1939
Married and 3 or more children	.8539*	.2182	.9762*	.2241	.8145*	.2124
Other with children	.5062*	.1776	.6403*	.1770	.5482*	.1725
Other without children	.1890	.1695	.2345	.1685	.2848*	.1656
Single-person in HH (omitted)						
Disabled person in HH	.0459	.0912	.0570	.0905	.0806	.0886
<b>Head's employment sector</b>						
Public sector	.1273	.1178	.2782*	.1134	.3096*	.1131
Private sector	-.0051	.1032	.1283	.1025	.1222	.1024
<b>Socioeconomic group</b>						
Employees	-.0478	.1387	-.0532	.1405	-.2631*	.1360
Farmers and a mixed group	.0131	.1341	-.0713	.1343	-.0648	.1334
Self-employed	.1739	.2194	.2232	.2226	-.1644	.2022
Welfare recipients	.5070*	.2407	.1136	.2861	.8907*	.2859
Pensioners (omitted)						
<b>Access to non-income sources and transfer participation</b>						
Possessing savings account	.2755*	.1643	.1906	.1523	.1996	.1456
Credit and loan transactions	-.2274	.2957	-.2149	.3231	-.1873	.2841
Participate in private transfers	.4455*	.1051	.4732*	.1061	.3582*	.0968
Participate in public transfers	.1145	.1108	.1528	.1109	.0652	.1053
<b>Poverty spell began</b>						
in 1995	-2.0499*	.0898	-1.9295*	.0917	-1.8439*	.0875
in 1996	-1.5085*	.1004	-1.4601*	.1022	-1.3866*	.1000
in 1994 (omitted)						
Cases available for the analysis	3485		3274		3357	
-2 Log Likelihood	10735.936		10532.981		11532.987	
	Chi-Square	df Sig	Chi-Square	df Sig	Chi-Square	df Sig
Overall (score)	1177.007	25 .0000	1083.422	25 .0000	1019.938	25 .0000

\*) Significant at 0.10 level

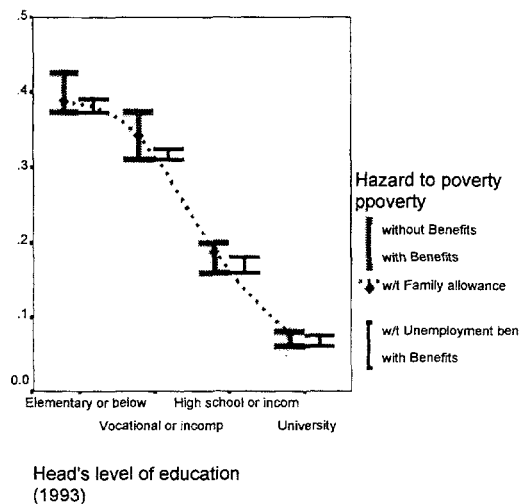
**Figure C-1a. Differences in Cumulative Hazard Function with and without Counting Social Benefits for Poverty Exit, by Region**



**Figure C-1a. Differences in Cumulative Hazard Function with and without Counting Social Benefits for Poverty Entry, by Region**



**Figure C-2a. Hazard to Poverty by the level of education of the HH head (Cumulative Hazard Function)**



**Figure C-2a. Hazard to outside-poverty by the level of education of the HH head (Cumulative Hazard Function)**

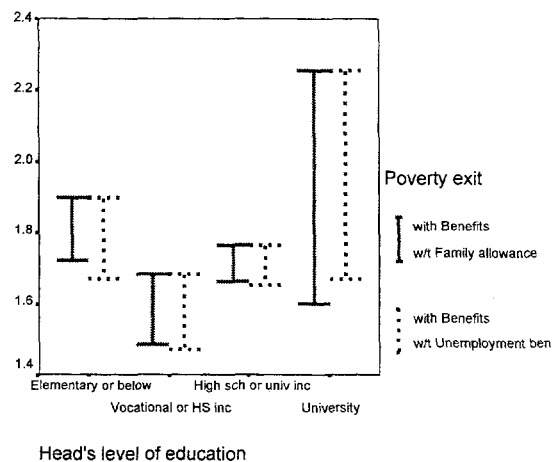


Figure C-3a. Hazard to poverty by size of household

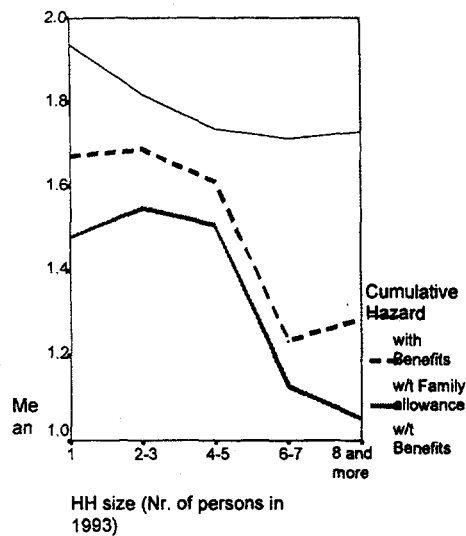


Figure C-3b. Hazard to poverty by dependency ratio

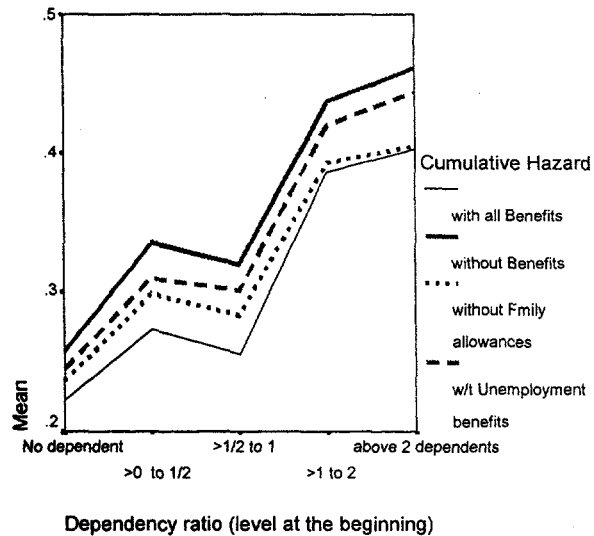


Figure C-4a. Hazard to poverty by age of the head of household

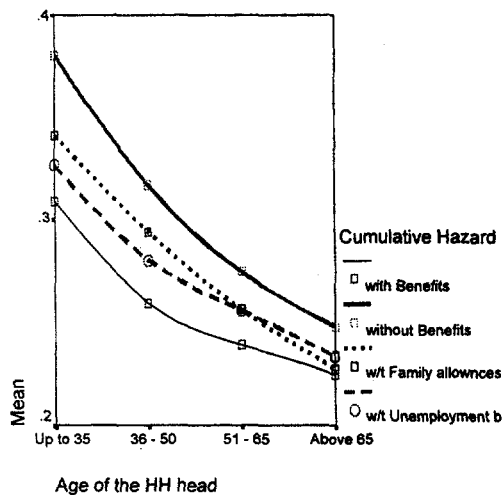
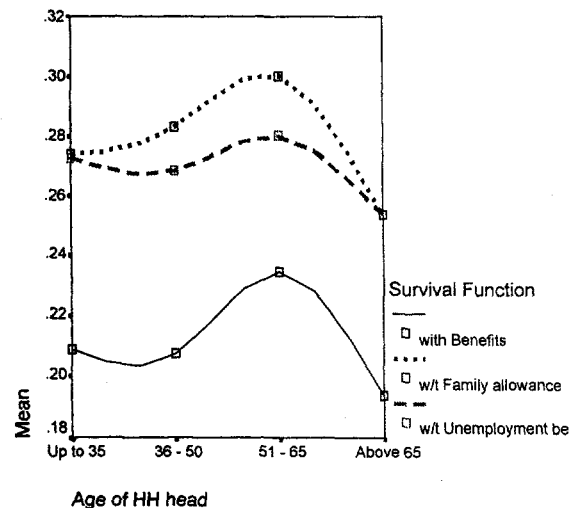


Figure C-4b. Survival in poverty by age of the head of household





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